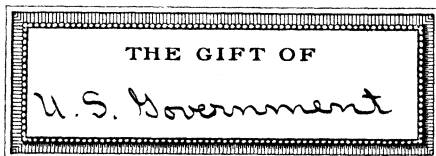
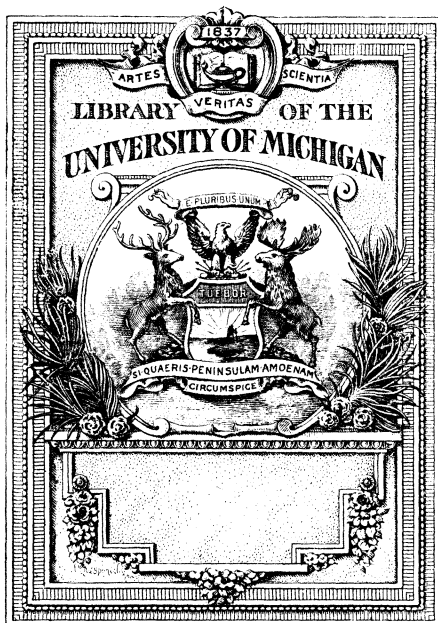


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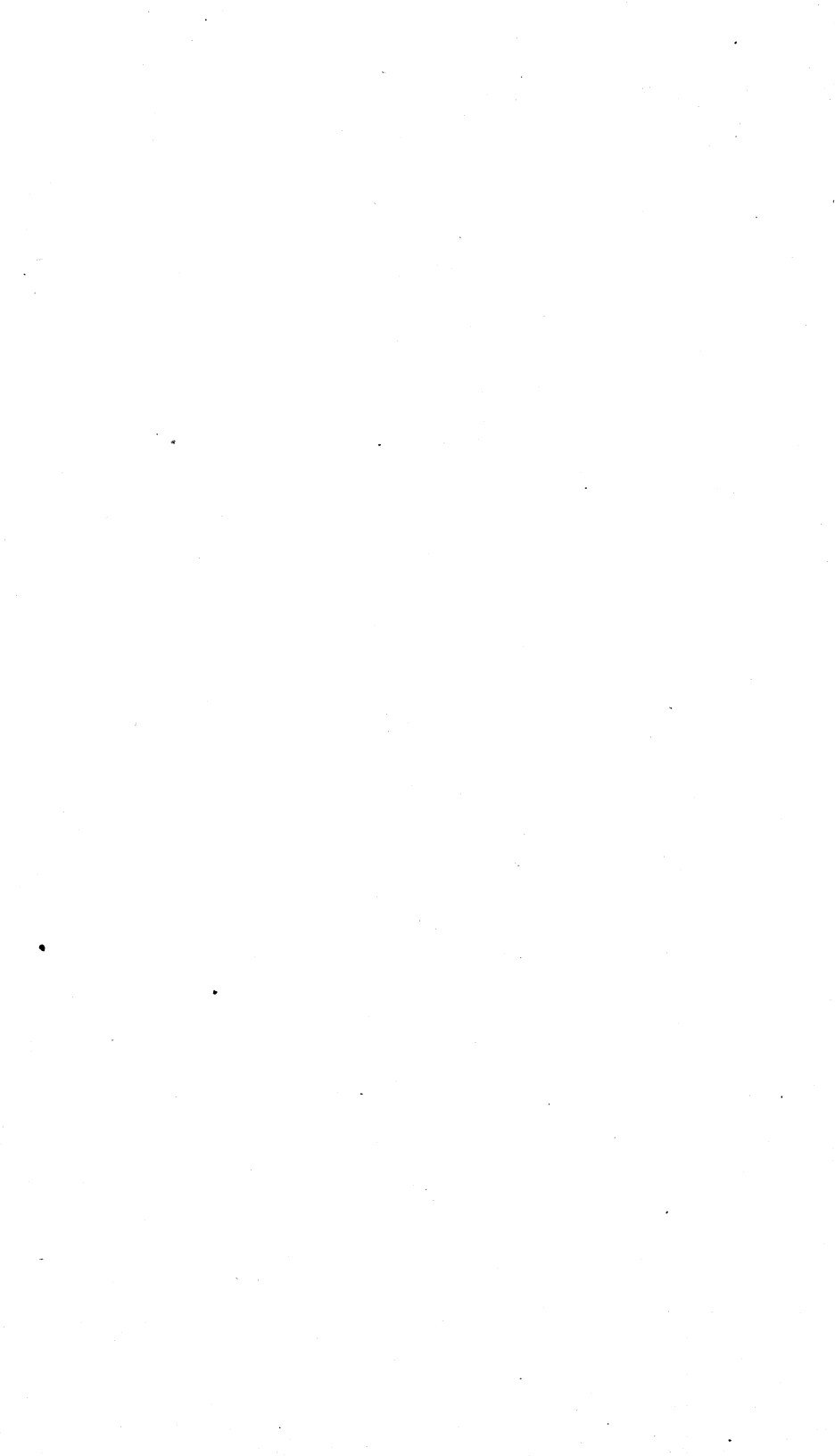
REPORT
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SEVENTH ANNUAL REPORT
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1906.

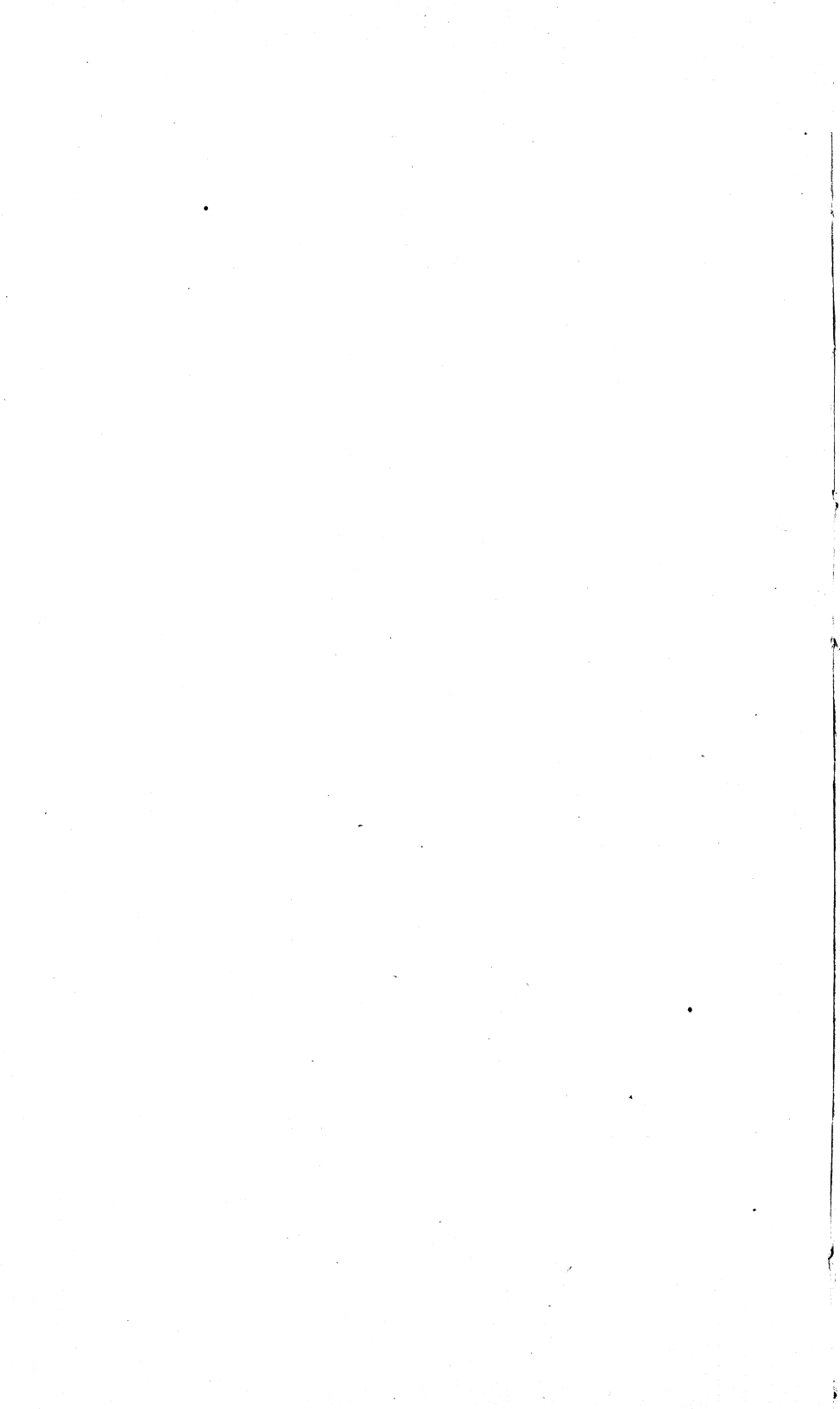
(IN THREE PARTS.)

PART 2.

BUREAU OF INSULAR AFFAIRS : : WAR DEPARTMENT.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1907.



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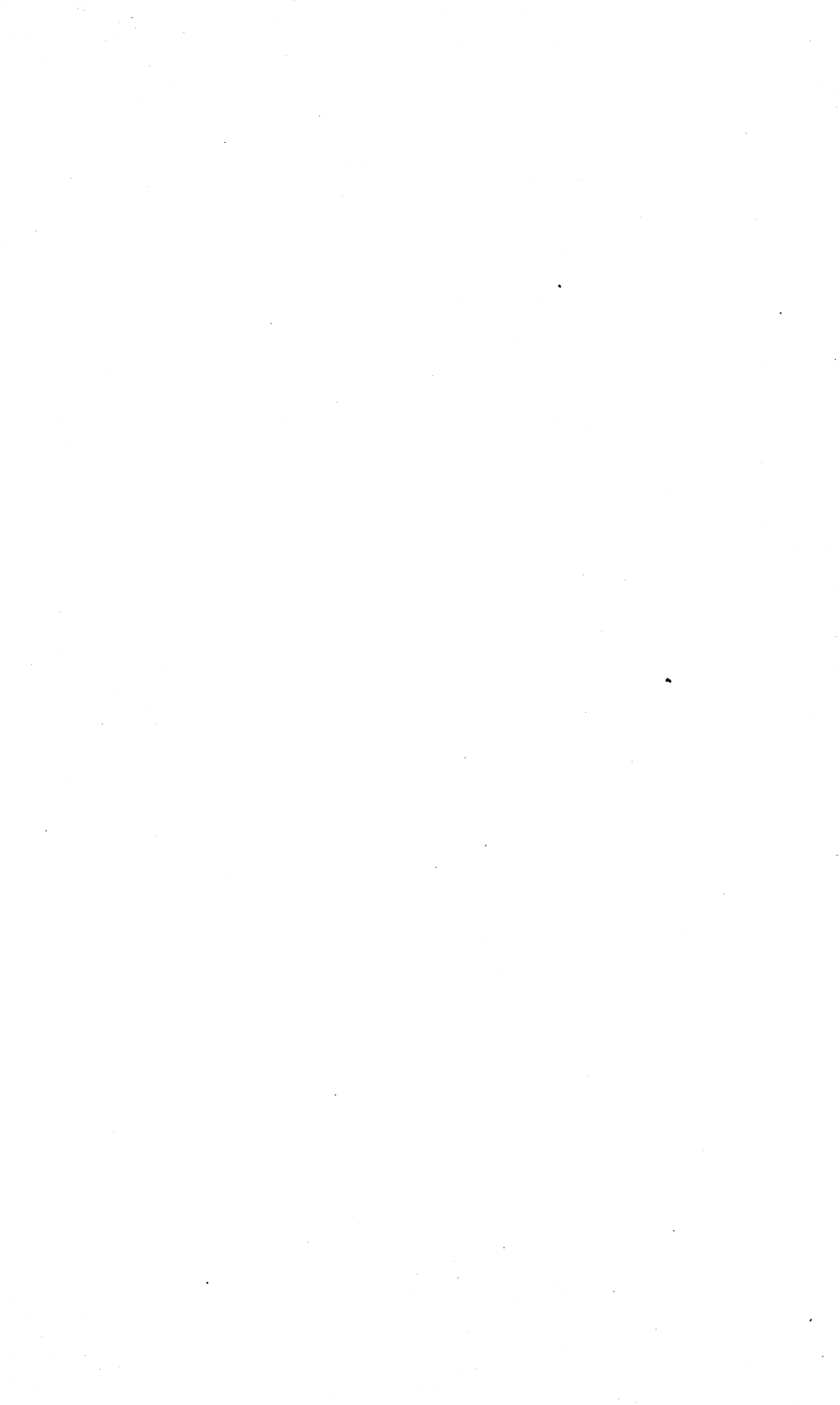
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REPORT OF THE SECRETARY OF THE INTERIOR.



REPORT OF THE SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
Manila, P. I., September 1, 1906.

GENTLEMEN: I have the honor to present the fifth annual report of the operations of the department of the interior, which, unless otherwise expressly stated, covers the year ending June 30, 1906.

ORGANIZATION OF THE DEPARTMENT.

The radical changes made in the organization of the department by act No. 1407, passed on October 26, 1905, although occurring during this period, were fully discussed in the last annual report of the undersigned, and it is not necessary further to discuss them at this time.

THE INSPECTION OF PROVINCES ORGANIZED UNDER THE SPECIAL PROVINCIAL GOVERNMENT ACT.

PALAWAN.

In accordance with the provisions of section 29 of act No. 1396 the secretary of the interior inspected during the year each of the five provinces organized under the special provincial government act.

In November, 1905, the province of Palawan was visited, and stops were made at the following points: Coron, on the island of Busuanga; Culion, on the island of the same name; Linapacan Island; Araceli, on the island of Dumarán; Cuyo, on the island of the same name, and Tinitian, Puerto Princesa, and Bono-Bono, Alfonso XIII, Aparauan and Bacuit, all on the main island of Palawan; also the island of Cagayancillo, and Balabac, on the island of Balabac.

The transportation problem involved in the administration of the affairs of this province has heretofore been very serious. The trip above outlined was made on a coast-guard boat under the most favorable circumstances. The captain of the boat was frequently compelled to run at night, when he greatly disliked to do so, yet seventeen days were consumed. Had the province paid for the boat at the usual rate the cost would have been ₱2,635, yet only important points were visited and stops were in many instances too short to have allowed the provincial governor and provincial treasurer satisfactorily to perform the duties imposed upon them by law. The undersigned had previously opposed a recommendation that a combined sail and power vessel of small dimensions be furnished Palawan in order that the provincial officials might at any time make such trips as circumstances required. This opposition was based on the belief that a vessel of the dimensions requested would

be almost certain to founder during some one of the severe storms which are of frequent occurrence in the Sulu and China seas. Personal observation of the performances of certain sailboats, locally known as "pancos," during very heavy weather, and the evident necessity of radical improvement in transportation facilities, if provincial officials were to be enabled to perform their duties in a satisfactory manner and if the court of first instance was properly to discharge its functions, led to a change of opinion and a recommendation that the province be furnished with a ketch-rigged boat, 44 feet along the water line, with a beam of 15 feet 10 inches, and equipped with an auxiliary petroleum engine of 22 horsepower. The construction of this vessel was authorized, and it has now been completed and has gone into commission. All question as to its seaworthiness was promptly settled. On its trip from Manila to Puerto Princesa it encountered typhoon weather, but behaved admirably, and finally made the port of Coron, in Busuanga, safely. Its light draft will allow it to seek refuge in shallow water in any one of the numerous harbors on the coast of Palawan and along the shores of the neighboring small islands; and the provincial governor and treasurer will now be able to visit such places as circumstances may require, and to make stops of such duration as may seem advisable, without incurring heavy expenditure. The saving on transportation during the first year will more than cover the cost of the new boat and the cost of operating it during that period.

According to the census of 1903, the province of Palawan has a population of 29,351, 27,493 of whom are classed as Christians and 1,858 as members of non-Christian tribes. The latter figure is very inaccurate. In point of fact the non-Christians in the interior of Palawan have never been enumerated and the figures in the census report are nothing more than an estimate. Of Moros alone there are some 2,500 in the province.

The non-Christians are divided into three tribes—the Moham-medan Moros, who have a few scattering settlements on the island of Balabac and along the southern third of the coast of Palawan; the Tagbanuas, who inhabit the interior of the southern third of the island and extend down to the coast in its central portion; and the Bataks, a Negrito tribe found in the interior of the central portion of the island and occasionally coming down to the east and west coasts.

The people sometimes referred to as Paluanes are Tagbanuas and those called Tinitianos are Bataks. Tagbanuas are also found in limited numbers on the islands of Dumarán, Linapacan, Bulalacao, Coron, Culion, and Busuanga.

The Moros of the province are chiefly renegades who have violated Moro laws and have been driven out of Jolo or Tawi-Tawi. They do not cultivate the soil. They fish a little, but for the most part try to steal their living from the Tagbanuas of the interior, by whom they are most cordially detested. Until within a short time they have engaged actively in piracy. Governor Miller now has them well under control, and a considerable period has elapsed since they have committed acts of piracy or crimes of violence. Better means of transportation will greatly facilitate the work of checking the abuses which they have heretofore practiced on the Tagbanuas.

The members of the latter tribe are normally peaceful, law-abiding, and, for wild people, reasonably industrious. They carry on fairly extensive agricultural operations, raising rice, camotes, bananas, and similar products in considerable quantity. They have retained and still use their ancient alphabet, the Mangyans of Mindoro being the only other Philippine tribe of which this is true. At Aparauan I found that 18 persons out of some 50 there assembled were able to read and write their own language.

Governor Miller has encouraged them to come down from the interior and build settlements on the coast and to engage more extensively than ever in agriculture. He will assist them with information and advice and will furnish them a considerable amount of seed. A number of their settlements have already been organized and others will be organized in the near future.

Conditions as to public order in the province are excellent. A party of convicts escaped from the Iwahig settlement, crossed the range to the west coast, and attempted to stir up trouble. They were promptly killed while resisting arrest, although the Tagbanuas did not take this action until they had consulted the provincial authorities and learned that it was their duty to arrest these convicts if practicable and that it was lawful to kill them if they resisted. In view of the fact that the convicts had several firearms and that the Tagbanuas were armed only with knives, bows and arrows, and clubs, their conduct in this matter is worthy of commendation.

The great curse of Palawan is caciquism, or the oppression of the poor and the weak by the rich and the powerful. It is practiced on the Tagbanuas of southern Palawan by the Moros and on the Tagbanuas and ignorant Christians of central and northern Palawan and the Calamianes Islands by the members of a few influential Christian families; many of the poor people having labored for years for these families at wages of 2 or 3 pesos a month and yet by some hocus-pocus have been made to appear to be heavily in debt to those who have practically enslaved them. If the poor man in his attempt to lead an independent life squats on a piece of public land and gets it under cultivation, even before he has had time to harvest his first crop the rich man appears and claims the land and everything planted on it as his. Not content with robbing the poor, several of these families have attempted to steal immense tracts of public land by instituting claims to ownership supported by manufactured testimony. Abuses of this sort have become so shocking that I deemed it advisable in several places to assemble the people, inform them of their rights, and assure them that they would be supported in efforts to secure them. Care was taken, whenever possible, to have the caciques themselves present at these meetings; abuses which they individually had perpetrated were explained in detail in their presence, and their victims were instructed as to the procedure which they should follow in order to obtain redress.

At Coron, where the caciques had succeeded in closing the public school and in preventing the erection of a presidencia and a schoolhouse, for which funds and material were available, they were warned that unless the school was reestablished at once and the schoolhouse and presidencia were promptly constructed the site of government of the settlement would be transferred immediately to a distant barrio. Governor Miller is cordially hated by the caciques of his province

on account of his efforts to protect its more helpless residents, and it is presumed that similar sentiments are now entertained by the caciques toward the undersigned, but the schoolhouse and presidencia at Coron have been built and the amount of land grabbing has appreciably diminished.

The Bataks, a little black people who were practically unknown in the days of Spanish sovereignty and who bore a most unsavory reputation which is quite undeserved, are probably not capable of any considerable progress in civilization, but are entirely harmless when reasonably well treated. They are now beginning to seek employment from the civilized natives and from some of the American residents.

While conditions in Palawan are still far from satisfactory, they are steadily improving, and I believe that better transportation facilities will result in much more rapid progress during the present year.

NORTHERN TRIP.

On March 4, 1906, the undersigned started on a seven weeks' trip through the northern provinces, in the course of which Nueva Vizcaya, Lepanto-Bontoc, and Benguet were inspected. Dagupan was reached by rail and the coast road and the sea beach were followed through Union, Ilocos Sur, and Ilocos Norte to Laoag, the capital of the last-named province. The maguey industry is developing rapidly in these three provinces, and it seemed desirable to observe the methods employed in cultivating the plant, harvesting the leaves, and cleaning the fiber. Three times too many plants were being set to the acre, the adult plants were in many cases being killed by overcropping, and retting was the method of fiber extraction universally employed. At numerous points maguey growers were called together and fully instructed as to proper methods of planting, harvesting, and fiber cleaning.

At Vigan a conference was held with the provincial board and the lieutenant-governor of Abra, and a number of important matters relative to the government of the Tingians of Ilocos Sur and Abra were settled. At Laoag some difficulties which had arisen in the administration of the affairs of the non-Christian residents of Ilocos Norte were disposed of.

One of the important objects of this trip was to visit the hitherto practically unexplored mountain region known as Apayao, situated in the eastern part of Ilocos Norte and the western part of the province of Cagayan. The inhabitants of this region, heretofore called Apayaos or Kalingas, annually make numerous head-hunting raids upon their Christian neighbors, and it seemed necessary to investigate the possibility of bringing about a satisfactory state of public order in this region, as had already been done in the country of the Igorots of Bontoc and the Ifugaos of Nueva Vizcaya. While the people of Apayao had an extremely bad reputation, it seemed probable that, as in the case of the two tribes above mentioned, it was largely undeserved. On the earnest recommendation of the local officials of Laoag a constabulary escort was taken, the party as finally made up consisting of Major Crawford, Lieutenant Atkins, and 25 men of the Philippines constabulary, and of Doctor Freer, the director of the bureau of science, Governor Blas Villamor, of Isabela Province, and the undersigned. Doctor Freer was absent from Manila on leave and

Governor Villamor had been authorized to accompany me at my urgent request, his presence being very necessary on account of his perfect knowledge of Ilocano and his great tact in dealing with primitive peoples.

Proceeding directly east to the town of Piddig we secured carriers for our baggage, and without encountering any serious difficulties ascended a dry river bed to the main range of the Cordillera Central, climbed the range and descended into Apayao, reaching the first houses of the settlement of Dallaoas at noon on the sixth day after leaving Laoag.

In spite of the fact that we had sent messengers ahead to announce our pacific intentions the inhabitants had all fled. However, in the course of the afternoon many of the men and boys returned and on the following day they accompanied us to the settlement proper. At this place men, all fully armed, were at home, but the women and children were missing. Friendly relations were promptly established and the women and children soon returned.

Although no two maps agreed as to the geography of this region we had hoped to strike the headwaters of the Ablug River and descend this stream to the town of Ablug on the coast. The small river on which Dallaoas is situated flows into a larger one which we were assured would take us to Ablug. Two and a half days were spent in constructing 13 bamboo rafts for the transportation of our party and its belongings and we then embarked on a voyage of discovery. The descent of the river to Ablug occupied eight days and was attended with no other misadventure than the repeated wrecking of our rafts through being dashed against boulders by the swift current.

The river valley was quite thickly inhabited. We visited 27 rancherias of considerable size, finding to our great surprise that the people, who must have numbered 20,000 souls, were not Kalingas but Tingians, and that they traced their ancestry to the Tingians of Ilocos Sur. Nearly all of them understood Ilocano. They were physically well developed, cleanly, and for wild people remarkably well dressed. Their houses, which had board sides and heavily thatched roofs, were far better built than most of those seen in ordinary Filipino villages. They were growing cocoanuts, cacao, tobacco, camotes, rice, taro, bananas, tomatoes, beans, and squashes, and seemed abundantly supplied with food.

We were at no time molested and the gift of a little scarlet cloth to the headmen of a settlement and of a few beads to the women sufficed in almost every instance to establish most friendly relations. In nearly every settlement visited we went through the formal Tingian ceremony for the establishment of friendship.

The question of head-hunting raids on Christian towns was fully discussed. The Tingians maintain that the inhabitants of the Christian settlements often rob them of the products which they attempt to take to market, run off their cattle, steal their young children to bring up as slaves, and sometimes kidnap their young women and keep them for immoral purposes. I am convinced that all of these charges are true and that such abuses are largely responsible for the head-hunting raids. On the other hand it is doubtless also true that the Tingians occasionally make unprovoked attacks when they think that they need heads to insure a good rice crop for the coming year or for other reasons.

I am of the opinion that this territory should be organized as a subprovince at the close of the present rainy season, and that a lieutenant-governor of courage and tact, supported by a good constabulary officer with half a company of men, can establish order in six or eight months by protecting the Tingians against the abuses of the Christians on the one hand and holding them in check when they attempt to raid the lowlanders on the other.

From Ablug we went to Aparri, where the constabulary and the director of the bureau of science left us. We then proceeded up the Rio Grande de Cagayan to Tuguegarao, the capital of Cagayan Province. The census report credits Cagayan with 13,414 non-Christians. There are at least 50,000 in the province, but in spite of previous earnest efforts to interest the governor and the provincial board in their welfare it was found that absolutely nothing had been done for them.

From Tuguegarao we proceeded to Ilagan, the capital of Isabela, where various matters pertaining to the non-Christian tribes of that province were settled. We then accepted the invitation of the Ifugao chief of the great settlement of Mayoyao and visited his people, stopping en route to inspect the Isabela friar estate and to establish friendly relations with the inhabitants of several Kalinga settlements. This trip was rendered difficult and at times dangerous by heavy rains and swollen rivers. We were met and escorted into Mayoyao by some 1,500 spearmen. This settlement has a wonderful series of terraced rice paddies extending far up the mountain sides. It stretches along a valley for ten miles and has a population of approximately 6,000 souls. The people, who had a bad reputation in Spanish days, are now well behaved and very friendly. They asked for a constabulary guard and an industrial school, and ought to have both.

NUEVA VIZCAYA, LEPANTO-BONTOC, AND BENGUET.

At Mayoyao Governor Villamor turned back and Lieutenant Gorman, with 10 constabulary soldiers, joined me. We proceeded to the Ifugao settlement of Banaue in Nueva Vizcaya by way of the Ifugao settlement of Ayangan, accompanied by numerous recently acquired Ifugao friends. As far as Ayangan we necessarily followed a war trail which ran along the treeless crests of mountains. The physical hardship involved was very great. At Banaue we met Governor Knight of Nueva Vizcaya, and all pending business relative to the non-Christian tribes of that province was dispatched. Accompanied by Governor Reed, Supervisor Kane, and Constabulary Inspector Nathorst of Lepanto-Bontoc I then crossed the Polis range and proceeded to the settlement of Bontoc by way of Ambuan and Talubin. A brief stop at Bontoc sufficed to dispose of necessary business pertaining to the affairs of the subprovince of the same name. We then proceeded to Cervantes, the capital of the province of Lepanto-Bontoc, and after attending to various matters there continued our journey to Baguio by way of Mancayan and Suyoc in Lepanto, and Loo, Buguias, Adaoay, Cabayan, Daklan, Bocod, and Ambuklao in Benguet, arriving on April 21, after seven weeks of constant travel.

My stay in Nueva Vizcaya, Bontoc, and Lepanto was cut short by illness contracted on the trip, but it is believed that all very necessary work was performed.

Conditions in Nueva Vizcaya are very satisfactory. During the past year Governor Knight has established friendly relations with the Ilongots of that province, and, as a consequence, their head-hunting raids have been discontinued. The Ifugaos have given no trouble to the Christians and have indulged in comparatively little warfare among themselves. The industrial school at Quiangan is largely attended and a similar school is being established at Banaue. The provisions of act No. 1396, relative to work on roads, trails, and public improvements, have made possible the completion of a provincial government building at Bayombong and great improvement in the trails of the province.

In Bontoc head hunting is practically a thing of the past, and most satisfactory progress has been made in trail construction. It is now possible to go to Balbalasan on horseback.

In Lepanto conditions are equally good. The people of this province have always been peaceable but some of them are thievish, and during the fiscal year 1905-6 there was a large amount of cattle stealing, which has now been checked. An immense amount of trail work has been done, the most important new enterprise being the construction of an 8-foot trail with a 6 per cent grade over Malaya Mountain and through the subprovince of Amburayan to the coast. The dirt work on this trail has been nearly completed and the rock work will be finished before the end of the present calendar year. This will give a one-day route to the coast, with no fords, in place of the present two and a half day route with thirteen fords, which become impassable during the rainy season. The province will thus gain an outlet for its products and the insular government will be saved heavy expense on the transportation of supplies.

The people of Benguet have always been peaceable and are now quite prosperous. They manage their own township affairs well and little interference is necessary. Many of the townships have a substantial cash surplus in the treasury. The most noteworthy feature of the administration of the affairs of this province during the year has been the immense amount of trail work completed. When the undersigned first made the trip from Baguio to Cervantes it cost five days of very hard riding. This year the time in the saddle from Cervantes to Baguio was less than two and a half days.

ESTABLISHMENT OF TWO NEW SUBPROVINCES RECOMMENDED.

The time has come when active steps should be taken to secure the establishment and maintenance of order throughout that part of the central mountain region of northern Luzon, over which no authority has ever yet been exercised. So long as the present governor of Isabela remains in office the Ifugaos of that province will be kept in order. I am, however, of the opinion that because of their hostility to the Klangas, the Ifugao rancherias of Isabela, which are all in the southwestern part of the province, might well be separated from Isabela and added to Nueva Vizcaya. The Kalinga territory west of the Rio Grande de Cagayan, from the Saltan River Valley on the south to the latitude of Dagara on the north, should be made a subprovince of Lepanto-Bontoc, and could be controlled by a lieutenant-governor and a competent constabulary officer with half a company of men. The capital should be at Tabuc, which is especially well situated as

regards facilities for communication with the Christian municipalities of Cagayan and with the Kalinga settlements. This subprovince would be bounded on the north by a second, which should include the territory of the Tingians of Apayao, and should extend to the northern end of the Cordillera Central and to the confines of the Christian municipalities of Pamplona and Claveria. The draft of an act embodying these recommendations will be submitted to the Commission as soon as two suitably qualified constabulary officers are available for duty in this region to assist lieutenant-governors in maintaining order.

ESTABLISHMENT OF NEW BOUNDARIES FOR BENGUET AND AMBURAYAN RECOMMENDED.

During the year it has been found necessary to remove the Igorot settlements of La Union from the jurisdiction of that province and bring them under the jurisdiction of Benguet or of that of the subprovince of Amburayan, in order that the Igorots might be protected from abuses. As a result, some questions have arisen as to the jurisdiction of courts and the payment of taxes. The territory occupied by the Igorots, who have been placed under the jurisdiction of the province of Benguet, should be annexed to that province, and that occupied by those who have been brought under the jurisdiction of Amburayan should be annexed to that subprovince. Alilem, the present capital of Amburayan, is an unhealthful settlement and communication between it and other rancherias is interrupted during the rainy season by swollen rivers. The Christian municipality of Tagudin in Ilocos Sur is often cut off from its provincial capital during the rainy season by the Amburayan River. It should be annexed to the subprovince of Amburayan and made its capital. This course would have the further advantage of making it possible for the authorities of Lepanto-Bontoc to carry the Cervantes trail through to the coast. Otherwise this trail would end at the Ilocos Sur boundary, and neglect on the part of the officials of the latter province might result in the interruption of communication. This whole matter has already been brought before the Commission and a survey of new boundaries, including Tagudin and the Igorot settlements above mentioned in Amburayan, has been authorized and is being made. When it is completed an act establishing these boundaries will be submitted to the Commission.

INSPECTION OF MINDORO.

On June 15 the undersigned left Manila on the coast-guard cutter *Polillo* to inspect the province of Mindoro and incidentally, with the assistance of an officer of the bureau of health, to gather up the lepers of that province in order that they might be sent to Culion. The first place visited was Calapan, the capital, where Governor Offley joined the party. We then proceeded to Naujan, Pola, Pinalamaylan, Mansalay, Bulaacao, Libagao Island, Sibolon Island, Semerara Island, Caluya Island, Sibay on Sibay Island, Ylin Island, the Mangyan settlement of Lalaugan, Magaran on the San José friar estate, Sablayan, Santa Cruz, and the Mangyan settlement of Banganay near that town, Mamburao, Paluan, and Port Loog on Lubang Island.

Conditions in Mindoro are excellent. The Christian municipalities, even in the smaller islands, are kept in good sanitary state, and as a result the health of the inhabitants has greatly improved. Native schoolmasters are everywhere in evidence. At Lalaugan and Banganay Governor Offley has accomplished what no one has heretofore been able to do—persuading the Mangyans to establish permanent villages and cultivate the soil. He has gained the confidence and regard of the gentle little people of this tribe throughout the island, and to a large extent has checked the abuses to which they were formerly subjected. In so doing he has earned the lasting ill will of the caciques of the province, who formerly enslaved or exploited the Mangyans. So far as is known, there is not an armed ladrone in Mindoro.

Governor Offley is a captain in the United States Army. It is to be hoped that his detail as governor of Mindoro may continue until he has further worked out his plans for improving conditions in that province.

THE BUREAU OF HEALTH.

The health work during the past year has been carried on with a degree of economy and efficiency not heretofore attained.

For an expenditure of \$0.025 United States currency per individual per year, based on a population of 6,500,000, more than 1,000,000 persons have been protected against smallpox, and of the 1,600,000 living in the provinces where cholera has appeared only 4,143 have contracted this disease, which has been kept confined to the provinces in the immediate vicinity of Manila and has not spread from Luzon to any other island.

DEATH RATE AMONG AMERICANS.

The death rate among American civilians living in the Philippines was only 9.34 per 1,000, while the death rate among American soldiers has been but 8.65.

After all due allowance has been made for sick persons who go home to die, it would seem to have been demonstrated that the white man's chances of contracting fatal disease are less in the Philippines than in any ordinary community in the United States.

GENERAL SUMMARY OF RESULTS.

During much of the year every energy of the full executive force of the bureau of health has necessarily been directed toward checking the spread of cholera; nevertheless more persons have been vaccinated, more sick treated, more permanent sanitary improvements made, more medicines distributed gratuitously to the poor, more nuisances abated, and more free dispensaries operated during the year than ever before; there have been less plague, less smallpox, and less beriberi than in any previous year since the American occupation. The expenses have been less than those of any one of the four years previous.

These facts demonstrate the wisdom of the Commission in doing away with a board organization for the performance of sanitary work and vesting in the director of health the powers heretofore exercised by the board of health.

NEW HEALTH LAWS.

By act No. 1487 the director of health has been given authority, subject to the approval of the secretary of the interior, to revoke or modify any order, regulation, by-law, or ordinance of a local board of health or of any municipality, except the city of Manila, concerning any matter which in his judgment affects the public health. He has had no occasion to exercise this authority, the mere fact that he possesses it having thus far sufficed to bring about the results desired.

REORGANIZATION OF THE BUREAU.

The fusion of the civil sanitarium at Baguio and the civil hospital with the bureau of health, and the requirement that the bureau of health should take charge of sanitary work in Bilibid Prison and in all insular prisons and penal settlements, and should exercise supervisory control over the sanitation of provincial and municipal prisoners, together with the transfer of the veterinary corps to the bureau of agriculture, have necessitated a complete reorganization of the bureau, which has been successfully accomplished.

NEW SANITARY LEGISLATION.

As a result of the antagonism between the Roman Catholic and the Aglipayan members of the community, many vexed questions have arisen during the past few years over cemeteries, the faction in power having frequently used the local board of health as a club with which to pound its adversaries. In a number of instances ordinances have been passed providing for the closing of cemeteries which were in perfectly good sanitary condition. It seemed wise to cover the whole subject of the establishment and maintenance of cemeteries by general legislation. This was done by the passage of act No. 1458, and as a result the squabbles heretofore so frequent have almost entirely ceased.

In response to an urgent demand on the part of the inhabitants of Manila, a sanitary code was prepared by the former board of health and submitted to the secretary of the interior for approval. It was found to be unsatisfactory in many particulars, and was returned to the director of health in order that its provisions might be simplified and its bulk greatly reduced. The code was practically rewritten by the present director of health, and, having received the provisional approval of the secretary of the interior, has been transmitted to the municipal board.

A committee of Spanish and Filipino physicians who objected to certain of its provisions were requested by the governor-general to draft a substitute code, which has also been submitted to the municipal board for its consideration.

In accordance with law this code will be returned by the municipal board with its recommendations, and when such of these recommendations as seem of value have been adopted by the director of health, and the code has been approved by the secretary of the interior, it will have the force and effect of law, unless an appeal is taken to the governor-general by the municipal board and is sustained by him, in which event he will prescribe the form which the code shall take.

In order to vest the troops engaged in patrolling the Mariquina River with necessary powers to enable them effectively to protect it from contamination, an act was passed by the Commission conferring upon officers of the United States Army in command of troops detailed at the request of the governor-general to aid the director of health in the enforcement of sanitary regulations, municipal health ordinances, and health laws, the status of peace officers with the right to bring the violators of such regulations, ordinances, and laws into court for trial.

Act No. 1457 makes it possible to proceed against all violators of sanitary ordinances designed to protect the water supply of Manila in the municipal courts of the city. This was necessary for the reason that the municipal officials of towns in the Mariquina Valley would not enforce health ordinances. The passage of this act has brought the offending officials to a realizing sense of their duty and it has not proved necessary to bring a single person to Manila for trial.

In spite of all efforts to increase the efficiency of the provincial health service the results obtained were such as to demonstrate the necessity of bringing the officers charged with this work under the immediate control of the director of health. By act No. 1487 provincial boards of health were abolished, the creation of health districts was provided for, and district health officers appointed by the governor-general, with the approval of the Commission and subordinate to the director of health, were substituted for presidents of provincial boards of health. Under the provisions of this act two or more provinces may be united in a single health district if such a course seems advisable to the Commission. Whenever it is shown to the satisfaction of the governor-general that a health district or a part thereof is threatened with or suffering from an epidemic of infectious, contagious, or communicable disease of a dangerous character, he may issue an executive order declaring that the district is threatened with or suffering from an epidemic and vesting the director of health with emergency power to prescribe, subject to the approval of the secretary of the interior, such emergency health regulations as may be necessary to prevent the spread of the disease. The director of health is thus given ample power immediately to meet emergencies as they arise.

A very important provision of this law makes it possible to institute legal proceedings against officers of municipalities which are found to be in an insanitary condition, such condition being almost invariably due to their failure to perform their duty. Filipino citizens are ordinarily willing enough to clean up their premises when directed to do so by proper authority.

CHANGES IN HEALTH DISTRICTS.

During the year the health districts of Manila have been reduced in number and made to correspond to the police districts. One station has been eliminated and the city has been saved nearly ₱7,000 formerly expended for salaries of police surgeons. Forty policemen perform special work as sanitary inspectors.

VITAL STATISTICS FOR MANILA.

Some progress has been made in getting more complete birth statistics. The recorded births for the year are 39.46 per thousand, as against 35.36 for the previous year. The figures are still far from correct, and it will doubtless take many years to convince the people of Manila that it is important to report births. The proposed sanitary code provides that baptismal or other records relating to vital statistics kept by churches or other institutions of Manila shall be accessible to the bureau of health. The birth statistics are still very incomplete.

The death rate among the permanent population of Manila was 40.90 to the thousand. If the deaths from cholera are eliminated, in order that a fair comparison may be made with the previous year, the rate is 38.51 to the thousand, a reduction of 2.48. In the campaign which the bureau of health has been waging against infant mortality, which continues to be shocking and is the one thing which keeps the Manila death rate high, great stress has been laid on the importance of using milk to feed infants. As a result the consumption of milk has increased 500 per cent, but no marked reduction in infant mortality has followed, probably for the reason that milk is almost universally diluted with water before sale, and that Pasig River or estero water is commonly used for this purpose. The proposed sanitary code contains adequate provisions for the punishment of persons who sell adulterated or contaminated milk.

MUNICIPAL PHYSICIANS.

In each health district the bureau of health has at least one Filipino physician, whose duty it is to attend the poor. There is no class of men in Manila who do more good or who render more valuable assistance to the bureau of health than do these municipal physicians.

CHOLERA.

The early history of the cholera epidemic which began in 1905 was given in the last annual report of the secretary of the interior. This history is brought down to date in full detail by the director of health in his annual report (Appendix A). By dint of the hardest and most painstaking work, which at times has strained the resources of the bureau almost to the breaking point, the disease has been confined within a radius of 75 miles of Manila. Up to July 1 the total number of cases has been 4,529; deaths, 3,418. In Manila the cases have numbered 385, the deaths 345. During the same period there have been 173 deaths from malaria, 227 from dysentery, and 1,048 from tuberculosis. In other words, cholera, the disease which tends to spread more rapidly than does any other, has been held so closely in check that the deaths during the period named were fewer than those from malaria and dysentery combined, and less than one-third of those from pulmonary tuberculosis.

The plan of campaign for the suppression of the disease has included the isolation of the sick in cholera hospitals when they could not be cared for safely at their homes, the thorough disinfection

of all contaminated houses and effects, the protection of the city water supply and the closing of wells in Manila, the prohibition of the sale of food-stuffs likely to spread infection, the protection of other food-stuffs by fly screens, and the education of the public in the precautions to be observed in order to avoid contracting the disease. No attempt has been made to quarantine contacts nor to institute land quarantine anywhere. Disinfection has been performed in such a way as to involve only the most insignificant property losses.

This plan of campaign has been found highly effective in the provinces, where the local officials and the people themselves have almost invariably cooperated heartily with the bureau of health. Its effectiveness has at times been seriously interfered with in Manila by the efforts of unscrupulous persons who have striven by every possible means to create hostility toward the health authorities. There is a deep-rooted fear of hospitals, not only among the more ignorant Filipinos, but among many of those of the better class. A Filipino physician has always been employed at the San Lazaro Hospital, but in order more fully to meet the desires of those who wish to be treated by physicians of their own race the services of two additional Filipino physicians were secured for the institute. They have done much toward allaying the perfectly groundless fear of this hospital, where the mortality had been 69 per cent at the time the agitation began, as against 100 per cent for cases cared for at their homes.

Under existing conditions fear and dislike of this institution and of the health authorities would, it is believed, soon die out were they not constantly stimulated. This, at all events, has been the case in the provinces, where the representatives of the bureau of health were usually regarded with dread on their arrival, on account of false newspaper reports coming from Manila, but in practically every instance succeeded in promptly gaining the confidence and good will of the local officials and of the people. Invaluable service has in many instances been rendered by provincial and municipal officials. This was especially true in Tayabas, where the disease threatened to break all bounds, and would probably have done so had it not been for the energetic and cordial cooperation of the provincial governor and other local authorities with the health officers. The results obtained in this instance show what may be anticipated when such cooperation exists.

The most hopeful feature of the cholera situation is the great progress which has been made in educating the people, more especially in the provinces, in the use of the simple means always available for combating this disease. The result has been that in very many towns semireligious processions held at night have been given up as sanitary measures, and the boiling of drinking water, the cooking of food, and the proper cleansing of hands have taken their place.

BUBONIC PLAGUE.

The methods adopted for the eradication of bubonic plague are proving effective and the number of cases has steadily decreased for three years. During the period covered by this report there were in the entire archipelago but 22 cases, with 18 deaths.

At one time during the year the city was threatened with a new epidemic. The bacteriological examination of rats has continued steadily, and after a long period during which they were found to be entirely free from plague many infected specimens were suddenly discovered. A large force of rat catchers was promptly employed. Radiating lines were drawn from the probable center of infection and rats were caught along these lines in all sections of the city and were examined bacteriologically at the bureau of science. In this way it was soon learned that the infection was confined to two centers—one a large block of buildings in Binondo and the other a small block in San Nicolas. So far as possible all rats in these districts were caught and killed and all rat runs destroyed, wood piles and other nesting places were removed, and premises were most thoroughly disinfected. The result was that the epidemic among human beings, which has heretofore invariably followed an epidemic among rats in any city, did not occur. This in spite of the fact that the number of cases of plague in Hongkong and Canton this year has been very unusually large.

VACCINATION AGAINST SMALLPOX.

During the year 1,245,893 persons are known to have been vaccinated; 2,180,692 units of vaccine were distributed and many persons were doubtless vaccinated of whom the bureau of health has no record. Except where sudden outbreaks of smallpox make departure from the regular programme necessary, this work is being carried out by islands and provinces. It has been completed in Cavite, Laguna, Bataan, Tablas Island, Cagayan, Isabela, Ilocos Sur, and Siquijor Island, and almost completed in Ilocos Norte, La Union, Batangas, and Cebu. Much has already been done in many other provinces. In every case as the vaccinations are completed smallpox disappears. The number of persons known to have been vaccinated is 238,689 greater than during the previous year. The cost was approximately ₱24,000 less.

THE CULION LEPER COLONY.

After seemingly endless and very vexatious delays the Culion leper colony, with facilities for the accommodation of 800 lepers, was finally opened in May, 1906. This colony is situated on a beautiful and healthful site. It is equipped with a modern sewer system, discharging into septic vaults, and is abundantly supplied with pure spring water, which is distributed throughout the colony and conducted to its numerous bath houses, latrines, and laundries. The houses are mostly of the ordinary Filipino type, although there are some fine buildings of hard wood. There is a good church, which has been completely renovated, a dining hall adequate to accommodate 300 people at one time, a well-equipped hospital for the badly disabled lepers, and an amusement hall for those in the early stages of the disease.

The first lepers taken to the colony were from Cebu. They protested against going, but on arrival were delighted with their surroundings, and have never ceased to utilize every opportunity to

express their delight with conditions at the colony and their gratitude to the Government for so generously providing for them. They have been allowed to organize their own municipal government, have established a leper police force, and maintain order in the colony. Band instruments were purchased for them in advance and a good band was immediately organized. To anyone who has seen these poor outcasts begging on the streets or driven half naked from the towns and obliged to inhabit inaccessible places and eke out a wretched existence as best they might, it is a great pleasure to see them comfortably housed, well fed, well clothed, and leading a normal and happy existence. They are free to go and come as they will. They bathe and fish in the sea and enjoy privileges of which they have heretofore hardly dreamed.

Unfortunately beriberi was introduced at Culion by the Cebu lepers. It was feared at the outset that this might give the place a bad reputation, but the cases have thus far been strictly confined to the people from Cebu, and at last accounts the disease had almost entirely disappeared.

The estimated cost to the Government for subsistence, housing, clothing, transportation, administration, etc., is estimated at ₱0.50 (\$0.25 United States currency) per leper per day. An annual outlay of about ₱800,000 would therefore be required to care for all the lepers in the islands. The Government could hardly support so heavy a fixed charge at this time, but definite progress looking to the ultimate entire elimination of leprosy is being made by cleaning up the archipelago, island by island. All lepers have been removed from Mindoro Province and from the islands of Maestro de Campo, Banton, Simara, Tablas, Romblon, Sibuyan, Negros, Siquijor, Palawan, and Cuyo. Those of Samar and Leyte will be transferred to the colony in the near future.

Careful bacteriological examination is made in each case before a patient is removed to the colony. In the territory thus far cleaned only about half the persons reported as having leprosy were found to be afflicted with it. The remainder had tropical ulcers or other infirmities.

Four Sisters of Charity of the Order of St. Vincent de Paul volunteered for duty in the Culion leper hospital, where they have performed most valuable services, as has a Jesuit priest, Father Valles, who volunteered as chaplain of the colony. The quarters for all non-leprous employees are on the opposite side of a hill and about a quarter of a mile distant from the colony. The director's house is situated on the other side of an arm of the bay, and is distant about 2 miles. He comes and goes in a small gasoline launch.

TREATMENT OF LEPROSY WITH THE X-RAY.

Treatment of leprosy with the X-ray has necessarily been discontinued on account of the breaking down of the old apparatus and the long time involved in securing and installing new equipment. Two lepers previously reported by Doctor Wilkinson as apparently cured both relapsed. One of them remained free from *lepræ bacilli* from June 6, 1905, until the first week of March, 1906, and the other from August 11, 1905, until about the middle of February, 1906.

Whether or not the cure would have been permanent had it been possible to continue the treatment can not be said. The use of the X-ray will be resumed and continued until definite results can be obtained.

SANITATION OF BILIBID PRISON.

There has been a material decrease in the death rate at Bilibid since the sanitation of that institution was placed under the control of the director of health. When he took charge in September, 1905, it had reached the extraordinary figure of 438.61 per thousand per year for that month. In October it dropped to 126.86, in November it was 128.8, in December 64.24, in January 43.28, in February 55.97, in March 72.10, in April 54.13, and in May 66.

It is believed that little further progress can be made until overcrowding is relieved and a modern system for the disposition of night soil and sewage is installed. Complete plans for such a system have been prepared by the sanitary engineer, and it is hoped that provision for its installation will be made in the public improvement bill for the fiscal year 1906-7. The present bamboo sleeping bunks harbor vermin of every sort. In order to prevent this condition and correct overcrowding, the director of health has urgently recommended that each prisoner be given at least 300 cubic feet of air space and that the bamboo bunks be replaced by steel-framed bunks with bottoms of canvas, or other material which can readily be disinfected. It is imperatively necessary that these improvements should be made, and that conditions in the prison hospital and in the tuberculosis hospital outside the prison walls should be promptly and radically improved.

CIVIL HOSPITAL DIVISION.

The record of the civil hospital has continued excellent. The total number of cases admitted for treatment during the year was 1,523, of which 923 were Americans and Europeans, 534 Filipinos, and 26 Chinese, Japanese, and East Indians. There were 1,272 male and 251 female patients. Of these 1,472 were treated by the civil hospital staff and 52 by outside physicians. The total number of deaths was 34, which gives a death rate for all patients admitted during the year of 2.23 per cent. Eight patients received in a dying condition should be subtracted from the total, making the true death rate 1.49. Three thousand and fifty calls were made upon patients outside the hospital and 47,322 in the hospital; 7,684 prescriptions were filled at the hospital dispensary; 10,367 dressings were done in the operating and dressing room and some 850 minor operations were performed upon patients not in the hospital for treatment.

Attention has been called to the fact that the present quarters of the institution are entirely inadequate both for hospital purposes and for housing the employees, and to the further fact that the existing arrangement imposes on the insular government a needless burden of expense. Plans for a new hospital are now nearly completed. It is earnestly hoped that its construction will soon be authorized and will begin before the end of another year.

BENGUET SANITARIUM DIVISION.

The old Benguet sanitarium was a combined hospital and hotel, with the hotel features predominating during the heated months of the year. This arrangement was not satisfactory either to patients or to guests in good health. In September, 1905, the transfer of the sick to one of the government cottages was authorized. Greater privacy was thus afforded them and more suitable quarters were made available for the treatment of the constantly increasing number of out patients.

On March 1, 1906, the government leased the original sanitarium building to Mr. Charles M. Jenkins to be used for hotel purposes, the demand for accommodations on the part of the public having reached such proportions that private capital was justified in embarking in the enterprise of caring for guests.

The sanitarium was used much more during the off season than ever before, the daily average attendance for November being 52 persons. After conversion into a hotel it was crowded to its limit during the hot season.

The number of sick treated at the sanitarium during the year was 151, of whom 31 were Americans and Europeans, 85 Filipinos, 31 Japanese, and 4 Chinese. Malaria, of which there were 26 cases, was the most important cause of disability among the patients. These cases came, for the most part, from other places with an altitude much lower than that of Baguio. Ten cases of amebic dysentery were treated. Of these 7 were chronic and 3 acute; 8 were cured and 2 improved. The director of health calls special attention to the great value of the climate of Baguio in treating this disease, but suggests that the popular idea that a month in Baguio is sufficient to cure persons suffering with cases of two months' to one year's duration is fallacious, the average period of treatment found necessary to cure such cases being sixty-five days. With each year it becomes more evident that persons suffering from general debility, whatever the cause, are very greatly benefited by the Baguio climate.

The highest temperature recorded during the year was 81° F. and the lowest 41.4°. The highest monthly mean temperature occurred in April, 1905, and was 74.78° F. The lowest monthly mean temperature occurred in February, 1906, and was 50.92°.

The cottage at present occupied as a hospital is inadequate to meet even present needs, which will grow steadily with the improvement in transportation facilities, which is being constantly and rapidly made. The erection of a properly constructed hospital building of moderate capacity should be undertaken immediately. The consulting architect has prepared plans for such a building, and a request for the necessary appropriation will be made when the public improvement bill comes up for consideration.

SANITARY ENGINEERING DIVISION.

The work of this division has been more efficient than ever before. The number of orders for the improvement of defective drainage, leaking vaults, bad plumbing, insufficient light and ventilation, and

for the installation of proper systems for the disposal of excreta has been much larger than during any previous year. The percentage of compliances with orders has been 80, as against 50 per cent for 1904-5. The sanitary engineer has been called upon to supervise construction work at the Culion leper colony and to submit plans for improving the sanitation of the Mariquina Valley, whence the present water supply of Manila is drawn.

TEST OF COPPER SULPHATE AS A GERMICIDE.

As a possible safeguard against the infection of the water supply of Manila, the bureau of science, at the request of the bureau of health, made an elaborate series of investigations as to the value of copper sulphate for killing cholera germs in water. Solutions varying from 1 in 50,000 to 1 in 2,000,000 were prepared and cholera organisms were introduced into them. From solutions varying in strength from 1 in 2,000,000 to 1 in 200,000 living cholera organisms were recovered, and they were also recovered after a period of four hours in a solution of 1 in 150,000. As the drinking of copper sulphate at a strength of 1 in 150,000 for any prolonged period could hardly be recommended, prediction as to the value of this substance as a germicide for city water supplies was not verified in this instance.

NECESSITY FOR IMPROVEMENTS IN MUNICIPAL WATER SUPPLIES.

If any one fact has been well established by the combined work of the bureau of health and the bureau of science, it is the absolute and fundamental necessity of improving the water supplies of municipalities. With very few exceptions towns at present get their drinking water from rivers, small streams, springs, shallow wells, or irrigation canals. Most of the rivers and streams have villages at frequent intervals along their banks and the refuse and sewage from these places, if not actually dumped into their waters, are washed in by the first rains. Springs are not protected, wells are not covered, and even rain water when caught from decaying nipa roofs is unclean, and on being kept in open jars soon becomes filled with larvæ of mosquitoes and other insects.

It has been claimed that Filipinos are practically immune to such diseases as are commonly contracted by drinking contaminated water. Doubtless the most susceptible individuals are killed in early infancy, and it is at best a case of the survival of the fittest, but examination of a very large number of stools shows that it is decidedly exceptional to find an adult Filipino who is not harboring one or more of the numerous parasites dangerous to human health which occur in these islands and which in the majority of cases gain access to the human system through drinking water. *Amœbæ* and the eggs of *Tricocephalis dispar*, *Ankylostoma duodenalis*, *Ascaris lumbricoides*, *Strongyloides intestinalis*, and *Oxyuris vermicularis* are all frequently found in one stool. The anemia, which necessarily occurs when a person harbors such an array of parasites, is certainly an important predisposing cause for the high infant mortality and for the low stature, poor physique, impaired vitality, low mentality, and lack of ambition so often seen among the poorer classes. Many of the municipalities, and especially those between Manila and Dagu-

pan, are so situated as to make it presumptively highly probable that they can be supplied with artesian well water. Others could readily pipe comparatively good water from clean mountain streams. The artesian well boring apparatus belonging to the government has been used to some extent during the past year in boring wells for municipalities. Another outfit has now been ordered and such provisions have been made that wells will be bored for municipalities at moderate cost and without charge unless good water is struck, while the government will be reimbursed for practically the entire expense incurred.

The bureau of health has prepared and submitted to the Commission a draft of an act designed to assist municipalities in securing pure water supplies. This act provides, among other things, for the setting aside in the insular treasury of a reimbursable appropriation to be known as a "Municipal water supply fund," upon which a certain number of municipalities, not able from their own local funds to pay at once for the installation of water systems, may draw, under suitable restrictions, funds thus borrowed to be repaid within a fixed period, and the municipalities in each case to impose on those who get the benefit of the water supplied, a suitable water tax until the debt has been paid, such tax, however, to be imposed only by a majority vote of the taxpayers who will get the benefit of the water. It is my opinion that such reasonable assistance in securing good water supplies as it may be feasible to extend to municipalities will bring more prompt and far-reaching improvement in the health conditions of these islands than could the expenditure of any similar amount on any other work save vaccination against smallpox.

FINANCIAL STATEMENT.

The expenditures of the bureau of health for the fiscal year ending June 30, 1906, have been as follows:

General expenditures:

Stationery, office and general supplies.....	₱26, 787. 92	
Medicines for indigent patients.....	6, 904. 16	
Transportation.....	32, 754. 61	
Bounty to rat catchers.....	6, 785. 95	
Sanitary stations.....	2, 402. 65	
Maintenance inmates Hospicio de San Jose.....	50, 499. 60	
Support of orphans of deceased Spanish officers in the Colegio de Santa Isabel.....	5, 267. 17	
Support of 69 full orphans in the St. Vincent de Paul Orphan Asylum for Girls.....	458. 85	
Incidentals.....	130. 84	
Salaries and wages.....	201, 903. 95	
		₱333, 895. 70
Vaccination division (including purchase and ice for preservation of vaccine, antiseptic supplies and dressings, salaries and travel expenses of vaccinators.....		68, 128. 71
San Lazaro Hospital division.....		109, 791. 45
Civil Hospital division.....		176, 687. 91
Prison sanitation division.....		20, 176. 23
Benguet Sanitarium division.....		51, 435. 05
Culion leper colony division.....		45, 087. 82
Cebu leper hospital.....		18, 800. 34
Sampaloc Hospital, July 1 to December 31, 1905.....		11, 185. 97
Total expenditures.....		835, 189. 18

Total amount appropriated by act 1416-----	₱991, 750.00
Receipts:	
From Benguet Sanitarium division-----	₱18, 977. 51
From Civil Hospital division-----	38, 211. 57
	<hr/>
	57, 189. 08
	<hr/>
	1, 048, 939. 08
Total expenditures-----	835, 189. 18
	<hr/>
Unexpended balance-----	213, 749. 90

A very complete statement of the operations of the bureau of health during the year will be found in the report of the director (Appendix A).

THE QUARANTINE SERVICE.

The quarantine service was maintained during the year with the high degree of efficiency which has characterized it since its establishment. The main efforts of its officers have naturally been directed to preventing the spread of cholera from Manila by sea to other ports and islands in the Philippines, or to the United States and its other possessions. In this they have been entirely successful. From the first appearance of the disease in Manila on August 23, 1905, until June 30, 1906, it can probably be said that not a single case was carried by any vessel to any point outside of Manila Bay. A single suspicious case occurred on a vessel lying at Iloilo, and numerous undoubted ones on board vessels while undergoing outgoing quarantine detention at Mariveles.

CHOLERA.

The large amount of experience gained justifies the conclusion that in the Philippines the incubation period of cholera is seldom if ever longer than forty-eight hours, and the detention period for vessels has been shortened accordingly. A careful study of all available evidence shows that the disease probably originated from a center of infection on or near Laguna de Bay (which was left over from the former epidemic), and that it did not escape the quarantine service and enter the islands from without. The service has rendered the bureau of health valuable assistance in its work of eliminating plague by preventing the importation of new cases.

VACCINATION AGAINST SMALLPOX.

The work of vaccinating crews of interisland vessels, which is performed by the quarantine service, has been so far completed that cases of smallpox among crews are now extremely rare, and occur only in persons who have been very recently appointed.

VESSELS BOARDED.

The total number of vessels boarded at Manila and other ports was 6,518; 59 of these were disinfected and 31 others were partially disinfected; 6 on account of cholera, 4 because of leprosy, 6 because of smallpox, and 3 because of plague. The disinfecting operations were highly successful, immediately and finally checking the spread of the disease in each instance.

VESSELS FUMIGATED.

One hundred and forty-three vessels were fumigated with sulphur to kill rats and other vermin, the material decrease from the number fumigated during the previous year being due to the fact that many ships bound for the Philippines are now fumigated at Hongkong.

INSPECTION OF BAGGAGE AND CARGO.

The magnitude of the quarantine operations will be understood when it is remembered that 62,111 pieces of baggage were inspected and 31,806 disinfected, and that 256,673 pieces of miscellaneous cargo were inspected and certified before being shipped to the United States.

AID TO OTHER SERVICES.

The usual aid has been extended to other services by making physical examinations of masters, mates, engineers, pilots, and other ships' officers, and by inspecting alien immigrants; making physical examinations of cadets for the nautical school, of officers and sailors employed by the bureau of navigation, and of candidates for the position of light-house keeper. Other physical examinations were made for the coast and geodetic survey, the bureau of posts, and the bureau of civil service.

CEBU QUARANTINE STATION OPENED.

On March 1, 1906, the new quarantine station on Cautit Island, in Cebu Harbor, was formally opened. The floating disinfecting barge formerly used at that point, being no longer needed, was removed to Iloilo, and the barge at the latter place will be brought to Manila for general overhauling at the close of the typhoon season.

EXAMINATION OF IMMIGRANTS.

Of the 2,860 alien immigrants inspected, 23, or eight-tenths of 1 per cent of the total number were certified for rejection. During the previous year 7.1 per cent of the total number examined were so certified. The great decrease in the number of rejections is doubtless due to instructions issued to the officers of the Marine-Hospital Service in China and Japan, as a result of which aliens intending to embark for the Philippines are given timely advice as to their physical condition. Many who would be rejected on arrival are thus saved the expense of the journey.

FINANCIAL STATEMENT.

The expenditures of the quarantine service for the fiscal year ending June 30, 1906, have been as follows:

Amount appropriated for the fiscal year by Act No. 1416-----	₱125,000.00
Expenditures:	
Salaries and wages-----	₱74,965.39
Office and general service expenses-----	2,432.34
Launch and barge supplies and repairs-----	9,085.01
Station supplies and disinfectants-----	10,899.09
Repairs to buildings and wharves-----	2,009.42
New construction and new equipment, ordinary--	1,622.43
	<hr/>
	101,013.68
Unexpended balance -----	23,986.32

Full details of the work of the quarantine service will be found in the report of the chief quarantine officer for the Philippine Islands (Appendix B).

THE BUREAU OF FORESTRY.

The efficiency of the bureau of forestry has been materially increased by the passage of the reorganization act (No. 1407), which transferred to the bureau of internal revenue the work of collecting government charges on forest products. The latter bureau is organized and equipped for the express purpose of making such collections, and can make them economically and effectively. The officers and employees of the bureau of forestry now have their time left entirely free for practical forest work, the nursery at Lamao having been transferred to the bureau of agriculture.

The working force of the bureau has been greatly strengthened. On July 1, 1905, there were present for duty but three foresters, two being absent on leave. During the early part of the fiscal year 1905-6, four new foresters were appointed as a result of competitive examination held in the United States, two were transferred from the United States Forest Service, and one returned from leave of absence, so that in November, 1905, ten were available for duty. The archipelago was thereupon divided into ten districts with one forester in charge of each. While some of these districts are necessarily very large, it has nevertheless been possible for the bureau to supervise the cutting operations of the important licenses in every province.

DUTIES OF FORESTERS.

In addition to inspecting cutting operations, it is the duty of foresters to complete as rapidly as possible forest maps of their respective districts; to study their forest resources; to prepare data for preliminary working plans for concessions; to inspect land which private persons or corporations desire to homestead, purchase, or lease, and determine whether it is more valuable for agriculture or for forest purposes; to attend to the registration of private woodlands and issue permits for the making of *cañingins* or clearings, and to collect data, giving for their respective districts the cost of gathering the various forest products, the means of transportation, and usual wages paid laborers.

EXAMINATIONS OF FOREST TRACTS.

Detailed examinations have been made of several extensive forest areas. On the east coast of Mindoro and in the northern part of Negros exclusive rights to work large tracts have been granted to the Mindoro Lumber and Logging Company and the Insular Lumber Company, respectively. The object of examining these tracts has been to collect data on which to base working plans. In the course of the inspections some interesting facts were ascertained. It was found that on 3,500 acres in the Mindoro concession there were more than 4,000,000 board feet of narra timber above 16 inches in diameter, and this represented but 8 per cent of the stand of commercial timber.

Ninety per cent of the Negros tract, which has a total area of 69

square miles, is in heavy timber of the third and fourth groups. Six merchantable tree species were counted, and were found to represent 89.3 per cent of the total stand of timber on the tract. It is estimated that there are at least 35,000 feet board measure of merchantable timber per acre on the forested area of this concession, adjoining which there are at least 200 square miles of public forest containing approximately the same stand and class of timber. Manufactured lumber from the tree species counted in making this valuation survey sells readily in the Philippines at good prices.

SPECIAL INVESTIGATIONS CARRIED ON BY FORESTERS IN ADDITION TO
THEIR REGULAR DUTIES.

Several of the foresters are carrying on investigations along special lines. The one in the Moro district is working on rubber and gutta-percha; the one in the Visayan Islands is working on mangrove swamps and their products; another one who has had special training in mapping forest areas has inaugurated a uniform system of mapping commercial and noncommercial forests and cultivated and uncultivated lands, which has been adopted for all of the districts.

NEW LEGISLATION.

By act No. 1407 it was provided that—

For the period of five years from the date of the passage of this Act, any resident of the Philippine Islands may cut or take, or hire cut or taken, for himself from the public forests, without license and free of charge, such timber, other than timber of the first group, and such firewood, resins, other forest products, and stone or earth, as he may require for housebuilding, fencing, boatbuilding, or other personal use of himself or his family. Timber thus cut without license shall not be sold nor shall it be exported from the province where cut.

Dealers in forest products, stone or earth taken from the public forests shall pay the charges prescribed in Article XIV of Act Numbered Eleven hundred and eighty-nine, entitled "The Internal Revenue Law of Nineteen hundred and four," on all such products taken by them. Every person, firm or company whose business it is to sell timber or other forest products, stone or earth, shall be regarded as a dealer in such products within the meaning of this Act.

The object of these provisions was to encourage the erection of substantial buildings throughout the provinces without relieving persons conducting a timber business from the necessity of paying the usual government charges. While this provision complicates to a considerable extent the work of inspecting the cuttings of regular licensees, it has nevertheless been a great boon to the people who have been encouraged in many regions to erect houses of wood and stone in place of the flimsy structures of nipa palm, grass, and bamboo which they were occupying.

Legislation has also been enacted by virtue of which companies engaged in constructing railways in the Philippine Islands may take timber from the public forests free of charge. Further legislation will exempt timber cut by private persons for sale to these railroad companies from the payment of charges, in order that timber merchants here may be able to compete with foreign merchants whose timber is admitted free of customs duties if imported by the railroad companies for construction purposes.

THE CAIÑGIN PROBLEM.

The making of caiñgins or forest clearings still continues to be the most serious source of damage to the public forests. It results in the destruction of large quantities of valuable timber which are felled and burned on the ground, while the fires thus started often spread to adjacent forests and cause great damage. It is evident that further legislation on this subject is necessary. Imprisonment and fines imposed under existing law have failed to prove effective. Many provincial and municipal officials have displayed entire indifference to the damage which ultimately will be done their respective provinces and towns through needless injury to the forests and have made little or no effort to enforce the law.

The director of forestry recommends that the power to issue caiñgin permits covering true forest lands should be withdrawn from municipal presidents and confined to foresters, and that the former officials should be allowed to issue such permits only for caiñgins on brush land or woodland, where the wood product is of secondary importance and where the land is more valuable for agriculture than for forest purposes; such areas to be indicated by the chief of the forest district in each instance and the present law to remain in force until they have been so indicated. The undersigned considers this recommendation wise.

TIMBER TESTS.

Investigation of the properties of the more important timbers have been continued steadily during the past year, and the bureau of forestry now has reliable information regarding the mechanical properties of 30 of the more important woods. Especial attention has also been given to the behavior of these woods in the dry-kiln and when submitted to various manufacturing processes.

The timber-testing machinery has also been used on samples of rope made from various grades of hand-cleaned and machine-cleaned maguay and Manila hemp.

WHITE-ANT TESTS.

On July 5, 1905, specimens of the following Pacific coast timbers were placed in the ground at Lamao, with a view to determining the extent to which they were subject to the attacks of anay (white ants) and decay: Red fir, western hemlock, spruce, white spruce, lodgepole pine, big-tree redwood, coast redwood, sugar pine, California white pine, western white pine, and cedar.

The samples of each of these species were attacked by white ants and most of them were eaten badly or entirely consumed. There was no damage from rot caused by fungus, the white ants working so rapidly that the fungus had little opportunity to get a start. Similar series of woods treated with mercuric chloride and with creosote were not attacked.

This test shows conclusively the very great danger of using these woods untreated for structural purposes in the Philippines.

CERTIFICATION OF AGRICULTURAL LANDS.

In my last annual report attention was called to the fact that the transactions in homesteading, sale, and lease of public lands had amounted to practically nothing. During the past year there has been a small increase in the number of applications to homestead, purchase, or lease such lands. Since the public-land act became effective the bureau of forestry has passed on the land covered by 398 applications for homesteads, 28 applications for purchase, and 1 application for lease, finding that the lands applied for were more valuable for agriculture than for forest purposes in all but 23 cases.

The average cost to the bureau of forestry of inspecting a single homestead has been found to be about ₱2.50.

REGISTRATION OF PRIVATE WOODLANDS.

Titles to 8 private estates, with a total area of 5,657.18 hectares, of which approximately 2,900 hectares were in woodland, have been registered at the office of the forestry bureau during the past year, making the total number of private estates so registered 149, with a total area of approximately 365,097 acres. The director of forestry is of the opinion that this list includes nearly all of the large woodland estates in the Philippine Islands and that the total area of private woodlands, registered and unregistered, will not exceed 500,000 acres.

FINANCIAL STATEMENT.

The expenditures of the bureau for the year have been as follows:

Salaries and wages.....	₱113, 775. 45
Labor hire for field parties.....	4, 521. 05
Per diems and traveling expenses.....	21, 497. 24
Transportation	1, 759. 55
Purchase of forest-product specimens.....	2, 039. 86
Office rent.....	1, 474. 31
Miscellaneous expenses.....	1, 166. 07
Purchase of supplies.....	4, 686. 11
Printing and binding.....	610. 93
Postage and telegrams.....	557. 20
Cablegrams	48. 82
Total	152, 136. 59

Full details of the work of the bureau of forestry will be found in the report of the director (Appendix C).

THE BUREAU OF SCIENCE.

On November 1, 1905, the bureau of mines was added to the former bureau of government laboratories, which was at the same time rechristened the "Bureau of Science."

NEED OF ADDITIONAL SPACE.

As was anticipated, the work in mining, mineralogy, and geology has been facilitated by this change, the staff of the former bureau of mines having been relieved of property responsibility, accounting, and civil-service work, so that their time has been left entirely free

for work in the field and for the elaboration of the results there obtained.

The only embarrassment resulting from this change has been the overcrowding of the building of the bureau of science. It was originally planned with a view to providing laboratory facilities and office space for the old bureau of laboratories and all of the workrooms were designed and equipped for laboratory work pure and simple. Future growth was arranged for by providing a room or rooms properly equipped for each kind of laboratory work which it was anticipated the bureau might be called upon to perform, the space in each room being sufficient for several workers.

At the time this building was constructed it was hoped that the scientific work of the government might ultimately all be provided for upon the exposition grounds, and two wings were planned, in one of which was to be accommodated the bureau of forestry and the bureau of agriculture, and in the other the bureau of mines and the ethnological survey. With the hospitals and medical schools established on the exposition grounds and the Manila observatory on the lot immediately adjacent thereto, there would have resulted a centralization of the scientific work which would have greatly facilitated administration as well as cooperation between the several bureaus. There has, however, been no time when the finances of the government were in such condition that anyone would have thought it wise to incur the necessary expense for new construction in order to carry out a theoretically more satisfactory method of housing bureaus when without such expenditure it was practicable to accommodate them in a reasonably satisfactory manner.

However, the transfer to the old bureau of laboratories of the botanists with their large and growing herbarium, the collectors with their constantly increasing series of natural history specimens, and finally the mining bureau with its large working collections and important exhibits, has had the following result: A room originally devoted to physiological chemistry has been assigned to the chief of the division of mines; a second, which was occupied by the serum division, to the geologist; a third, which was used by one of the chemists, to the topographical work of the division of mines. Three of the rooms originally intended for medico-biological work have been devoted to botany and entomology, and the room intended for pharmacological investigation has been given to the collectors of natural history specimens, while the laboratory workers, who naturally would have occupied this space, have been crowded into laboratory rooms designed and equipped for other lines of investigation.

This arrangement, while at present workable, is far from satisfactory, and it is earnestly hoped that in the not very distant future space may be gained by transferring the botanical, zoological, mineralogical, geological, and paleontological exhibits to some place where they can be more satisfactorily housed and where the public can be given an opportunity to see them.

CHANGE IN FORM OF PUBLICATIONS.

The most important change in the work of the bureau, apart from those involved in its reorganization, has been the issue of its publications in the form of a journal known as the *Philippine Journal of*

Science instead of in bulletin form as heretofore. The volume of results obtained had become such as to make this change practicable, and it seemed desirable, not only for the reason that a journal appearing at regular intervals would command more attention than would a series of bulletins, but because the net cost of publication would be reduced materially by cash payments for subscriptions, while numerous scientific publications heretofore paid for could be had in exchange and a further saving thus made.

While the articles published in the Philippine Journal of Science are necessarily limited to scientific subjects of interest and value to the people of this country and to outsiders seeking reliable information, they are not all contributed by officers and employees of the bureau. There have already appeared important articles by Dr. W. T. Councilman, of the Harvard Medical School; Dr. Shibasaburo Kitasato and Dr. K. Shiga, of the Imperial Institute for Infectious Diseases, Tokyo, Japan; Dr. Charles F. Craig, of the United States Army; and Dr. E. R. Stitt, of the United States Navy.

The seven numbers which have thus far appeared have contained a large amount of valuable matter. The value of the scientific exchanges already arranged for, is approximately ₱2,000 per year, and in spite of the custom which prevails quite generally among scientific men of Europe and America of not subscribing for a new journal until it has at least completed its first year, and of the further fact that there has been time to hear from the first three numbers only, the subscription list now includes residents of every important country of the globe. The cost to the government of issuing its scientific publications should decrease steadily for some time to come and the Journal should become self-supporting within a few years.

THE SCIENTIFIC LIBRARY.

The library has shown a steady and satisfactory growth. The expenditure of the total amount originally decided upon for the purchase of books was purposely spread over several years in order to allow time for the erection of a new building without which adequate library facilities could not be had. One-half of the last remaining annual installment of the book appropriation has been requested and appropriated for the fiscal year 1906-7. As a result of scattering the appropriations over so long a period, there were outstanding a number of old and unfilled book orders which necessitated holding out of the general treasury a considerable sum of money and served to complicate bookkeeping. All of these old orders have been canceled and new orders placed. The cash previously held out has been returned to the treasury and the cost of the new orders has been met by the practice of strict economy in connection with all the general expenses of the bureau.

The cataloguing of the library has progressed satisfactorily on the whole, although the work has been greatly interfered with by the necessity of twice hastily removing from the shelves the entire collection of books in order to prevent its being ruined by floods of rain water which drenched the reading room and stack rooms. The defect in roof construction which caused the leakage has now been remedied.

The library fund was increased during the year to the extent of some 3,000 pesos by the sale of a series of photographic prints from

the very valuable collection of negatives owned by the government. These prints, which are ordinarily sold without descriptions for ₱0.20 each, brought ₱1 each as a result of the preparation by the undersigned of a full series of descriptions to accompany them, and the amount in excess of the usual charge for making the prints was converted into a special fund for the purchase of books for the scientific library. The sale of two additional sets of photographs on similar terms has now been arranged for, and a corresponding increase in the amount available for the purchase of books during the present year will result.

Valuable donations of books have been received from a number of foreign governments and societies in return for the publications of the bureau.

THE WORK OF THE DIVISION OF BIOLOGY.

The biological laboratory has been short-handed on account of the sickness and absence of members of its staff. Important results have, however, been accomplished.

TEST OF DOCTOR STRONG'S CHOLERA VACCINE.

Doctor Strong's cholera vaccine has been manufactured and tested upon a considerable scale. At Angat, in Bulacan, 1,078 individuals, or about one-sixth of the total population, were vaccinated. Cholera has since reappeared in the surrounding towns, and up to September 3 88 cases have occurred among the unvaccinated in Angat with but 1 among the vaccinated. At Siniloan and Mabitac, in Laguna Province, 1,879 and 527 persons were vaccinated respectively. There has been practically no cholera in these towns since the vaccinations were performed, but this fact is of small significance for the reason that there has also been very little in adjacent towns. On a street in Manila where cholera has been persistent 116 persons were vaccinated. The disease has spread rapidly on this street since, but none of those vaccinated have developed it. Three hundred individuals were vaccinated at Malolos, with no subsequent cases of cholera among them.

Half of the prisoners in Bilibid Prison were vaccinated in September, 1905. At this time cholera disappeared as a result of other sanitary measures taken. It has since twice reappeared. Only 1 of the vaccinated inmates has become infected. Ten months have elapsed since his vaccination, and he had either never been immunized or had lost his immunity.

An opportunity for a really satisfactory demonstration of the value of this vaccine has not presented itself. Cholera has been confined to towns in Luzon which could be quickly reached, and where effective sanitary measures have resulted in promptly checking it. The exact value which should be attributed to vaccination as a preventive of cholera has, therefore, not been determined, but the high blood immunity produced and the almost entire absence of cases among the persons vaccinated strengthen the view advanced last year that we have in this vaccine an effective immunizing agency.

Doctor Strong has also been steadily engaged in developing a vaccine against bubonic plague by the use of greatly attenuated

plague organisms. The blood immunity obtained is greater than that caused by any other method which has heretofore been employed.

INFECTION BY ANIMAL PARASITES.

Some new and important discoveries relative to the organisms which cause amœbic dysentery have been made. Owing to the great frequency of infections by animal parasites, some of them very fatal, which has been discovered during the present year through autopsies, the employment of a competent medical zoologist who will take up this special line of work has been authorized.

STUDY OF BERIBERI.

Doctor Herzog was sent to Japan in order to take advantage of the extraordinarily favorable opportunity for studying beriberi presented in some of the Japanese military hospitals. This disease is of common occurrence in these islands, especially in prisons and jails and among gangs of road laborers, and it sometimes causes serious loss of life. Its nature is not as yet well understood. Doctor Herzog's results were chiefly negative. The Japanese physicians, Okata and Kokubo, thought that they had isolated a specific organism which caused beriberi. Doctor Herzog has demonstrated quite conclusively that they were in error.

LABORATORY FACILITIES FURNISHED ARMY BOARD FOR STUDY OF TROPICAL DISEASES.

The Bureau has been glad to be able to give the army board for the investigation of tropical diseases space and facilities in the biological laboratory for its work, the results of which will be available for publication in the Philippine Journal of Science.

WORK OF THE BOTANICAL DIVISION.

The work of the botanical division has progressed most satisfactorily. The herbarium now contains 31,000 specimens, of which 24,000 are Philippine. The number of distinct Philippine plant species presented is approximately 6,000, of which 4,500 have been fully identified and 1,500 have been identified as to genus only. The Philippine botanical collection is now recognized throughout the world as the best which exists. The satisfactory condition of identifications is due in a large measure to the hearty cooperation of foreign botanists. It is not too much to say that the center of botanical work upon the Philippine flora has now been transferred from the laboratories of Europe to Manila, where it belongs. The herbarium is in such condition that it may serve as a satisfactory basis for work in economic botany, and detailed investigations of the rattans and of medicinal plants are already under way.

ENTOMOLOGICAL WORK.

The entomological collection continues to grow rapidly. At present too much of the time of the entomologists is occupied by the preparation of specimens. This could and should be done by Fili-

pino assistants. The most important work has been on insects attacking the cocoanut palm and on locusts and mosquitoes. The results of the first series of investigations have been published. The second series was brought to a close by the death of all experimental material at the beginning of the dry season. Locust fungus, which was imported in the hope that it might be used in fighting this plague, worked successfully for a short time and then became quite useless, either through the loss of its virulence or through the building up of an immune race of locusts. Precisely similar experiences were had with it in South Africa and in the United States. An effort is now being made to find some other fungus or some parasitic organism which will attack locusts and cause epidemic disease among them.

Work upon Philippine mosquitoes, with especial relation to the part which they play in propagating malaria and other diseases, is progressing favorably and results will soon be ready for publication.

COLLECTION OF NATURAL HISTORY SPECIMENS.

The collection of natural history specimens, consisting chiefly of birds, mammals, reptiles, and mollusks, has continued steadily. Mr. McGregor, who is in immediate charge of this work, was absent on a long leave in the United States, but his two Filipino assistants did good service. It is believed that Mr. McGregor's force constitutes one of the most economically conducted collecting parties which has ever been put into the field in the Tropics, and the amount of valuable material obtained is very large. When museum space is available it can be filled promptly with many of the rarest and most interesting representatives of the Philippine fauna. During the past year the sales of duplicate specimens have been sufficient in amount nearly to cover the entire cost of this branch of the work.

In the Philippines, as in other civilized countries, birds afford one of the most interesting subjects for nature study and the number of persons interested in them is large. Unfortunately the descriptions of Philippine birds are scattered through large series of expensive volumes in such a way that they have heretofore been practically inaccessible except to persons with a considerable degree of ornithological training. In response to the popular demand for literature on this subject there has been published a hand list, prepared by Mr. McGregor and the undersigned, which includes all species known to inhabit the Philippines, giving for each the islands on which it has been found and a reference to the work in which it is described. While this meets, in a way, the needs of those who live in or near Manila, by making the literature in the scientific library available for them, it is of little help to school-teachers and others in the provinces. What they need is a complete series of brief and simple descriptions of Philippine birds. Present indications are that a publication embodying such a series of descriptions could be made to pay for itself if sold in advance by subscription and one will be prepared in the near future.

WORK OF THE DIVISION OF CHEMISTRY.

This division has been able not only to perform the usual and necessary routine work, but to carry on some economic investigations of importance. Doctor Clover has devoted himself especially to the

investigation of gums and resins and has succeeded in isolating a number of products likely to be of commercial importance.

Work on fibrous substances suitable for the manufacture of paper has been carried on throughout the year by Doctor Richmond, who has successfully demonstrated that in two of the Philippine grasses, known as cogon and talahib, in abacá waste, in several species of bamboo, in buri palm, in a number of common woods, and in cocoanut husks, these islands possess a store of valuable paper-making material which now seems almost inexhaustible. In view of the great scarcity of paper-making materials in other countries, notably in the United States, this fact is likely to become of great commercial importance. The detailed results obtained in the investigation of the availability of the materials above mentioned have already been published. The second portion of this work embodying data as to the available supply of raw materials, their cost, and the expense of chemicals and machinery necessary for paper making, is approaching completion and results will be published during the present year.

Systematic investigations of the oil-bearing seeds and fruits of the islands has been continued in order that the availability of oils from this source for use in the manufacture of paints and as food products might be determined. It has been found that the pili nut, which occurs abundantly in the provinces of southern Luzon, furnishes a table oil superior to olive oil in food value and of a most agreeable flavor. Other oils, not previously known to commerce, have been studied and their commercial value demonstrated.

The work on the cocoanut, on which Doctor Walker had been engaged for more than two years, has been completed and published. His series of tables showing the relation between the age of nuts and the amount of their oil content, as well as that showing the quantity of copra produced by trees growing in different situations, are of great practical value, as are the results of his investigations as to the causes of rancidity in cocoanut oil. He has demonstrated conclusively that really pure oil keeps for an indefinite period and that rancidity is caused by mold in copra and by impurities introduced into the oil during manufacture. The conditions under which copra should be prepared and oil extracted in order to insure good keeping properties have been fully ascertained and described.

Doctor Bacon, in conjunction with the botanists, has recently taken up the important work of investigating the medicinal plants of the islands. Comment on his results would be premature at this time.

Doctor Cox, who succeeded Doctor Lewis in charge of the work in physical chemistry, is especially trained and interested in the chemistry of minerals. He has already undertaken a study of the gas produced by Philippine coals, and has apparently demonstrated the fact that the best results can be obtained by using these coals as a basis for the manufacture of so-called "producer gas."

His work is especially important for the reason that, while all Philippine coals thus far discovered are lignites, the work carried on by the United States Geological Survey has demonstrated that even the poorer grades of lignite may be made to yield values in excess of the best grades of coal when "producer gas" is made from them and is employed in gas engines.

WORK OF THE DIVISION OF SERUMS AND PROPHYLACTICS.

Doctor Woolley, chief of this division, left the bureau April 1 to go to Siam and undertake the establishment of a serum laboratory there. Owing to the great difficulty experienced in securing a competent successor, and the close relationship existing between the serum work and the medical work of the biological laboratory, it was decided to fuse the serum division with the latter laboratory, placing the work under the general control of Doctor Strong.

As previously stated, arrangements have been completed for the transfer of the care and maintenance of the serum herd to the bureau of agriculture. This will result in distinct advantage to the bureau of science, whose employees will no longer be compelled to busy themselves in the purchase and feeding of cattle and in their sale after they have ceased to be valuable for serum purposes, but can devote themselves strictly to the scientific side of the preparation and standardizing of serums and prophylactics.

The work of the division has consisted in the preparation of rinderpest serum, antiplague serum, plague and cholera vaccines, diphtheria and tetanus antitoxines, mallein, and vaccine virus for smallpox. A number of important improvements in the methods of manufacturing sera have been introduced, and this division has successfully met the heavy strain imposed upon it by the tremendous demand for serum during the epidemics of rinderpest in Negros and Zambales. When the disease had been checked, not only in these provinces but throughout the islands, the demand for serum fell almost to zero, and it became necessary, in the interest of economy, to dispose of a considerable part of the serum herd. The sudden reappearance of the disease at half a dozen points in the Archipelago during the early part of the present rainy season made it necessary to again rapidly develop a serum herd, and at present the division is barely able to supply from day to day the serum urgently needed by the bureau of agriculture. As it is reasonably certain that rinderpest must be combated in these islands for a number of years before it can be entirely eliminated, and as the presence of surra in many herds of cattle and carabaos necessitates the use of serum alone rather than of serum and virulent blood simultaneously when such herds are attacked, it becomes increasingly important to find some less expensive method of perpetuating the disease than the present one of giving it to one susceptible animal after another. Furthermore, so large a number of immune animals have already been produced that the purchase of nonimmunes is becoming very difficult. Out of a lot of 15 cattle recently purchased not a single animal could be given the disease. If the organism causing rinderpest could only be isolated and cultivated, the cost of manufacturing rinderpest serum could be enormously reduced and the conditions attending its manufacture greatly simplified.

THE DIVISION OF MINES.

Since coal-producing areas are known to exist in Luzon, Batan, Polillo, Mindoro, Masbate, Negros, Cebu, Samar, Leyte, and Mindanao, and as the importance of developing these deposits is too great to admit of discussion, the work of the division of mines is at present

being largely concentrated on an effort to secure information which will render such development certain.

The investigations recently made have been chiefly on the coal fields of Cebu, and have already led to considerable investment in coal lands there.

Meanwhile work in the gold fields has not been neglected. A topographical survey and geological reconnaissance of the gold-bearing regions of Benguet has been completed and the results are ready for publication. The chief of the division has made a preliminary examination of conditions and of results of development work in the district of Auroy, in Masbate, and Mr. Eveland and Mr. Goodman will be sent there to make a topographic survey and geological reconnaissance as soon as they finish the work upon which they are at present engaged.

Mr. McCaskey, the chief of the division, has kept in close touch with miners conducting active operations throughout the Archipelago and has rendered them all practicable assistance.

FINANCIAL STATEMENT.

Amount appropriated for the support of the bureau during the fiscal year-----	₱315, 000. 00	
Platinum still fund-----	4, 840. 39	
Amount allotted from relief fund-----	20, 182. 78	
		₱340, 023. 17
Receipts:		
Actual miscellaneous cash receipts, including sale of vaccine virus, antirinderpest serum, photographs, cattle and calves, and examinations and analytical work for private persons--	38, 586. 61	
		378, 609. 78
Expenditures:		
Salaries and wages-----	₱185, 563. 61	
Transportation-----	8, 994. 01	
Chemicals, supplies, apparatus, office supplies, etc-----	59, 217. 81	
Cattle, calves, small animals, and food for same--	39, 155. 55	
Printing and binding-----	16, 485. 29	
Postage and post-office box, repairs, telephone and fire-alarm service, and miscellaneous expenditures-----	5, 688. 38	
		315, 104. 65
Balance returned to treasury-----		63, 505. 13

A very complete statement of the operations of the bureau of science during the year will be found in the report of the director of the bureau (Appendix D).

The bureau of science is authorized by law to charge other bureaus of the insular government for supplies furnished, but may not charge for work performed. It is, however, required to keep account of the cash value of the work performed for each bureau of the government and annually to report the value of the work performed for each bureau. The value of this work is estimated in accordance with a fixed scale of charges, which on the average are lower than would be imposed for the performance of similar work by reputable scientists in the United States. Provincial and municipal governments are required to pay for work performed as well as for supplies furnished.

On the basis of this scale of charges the total value of work performed for other bureaus and for provinces, municipalities, and private persons during the year was ₱213,326.41. Of this amount ₱175,239.80 represents the value of free work performed, while ₱38,586.61 represents the value of the work for which cash was paid.

However, in estimating the value of work performed vaccine virus was charged for at 1 centavo per unit, rinderpest serum at ₱7.50 per bottle, and mallein at 10 centavos per dose. Nowhere in the world can these commodities be purchased at the prices named, which represent the approximate cost to the government of producing them. In point of fact the prices for the year on vaccine virus and rinderpest serum were too low, having been fixed in advance on estimates of the director of health and the director of agriculture, as to the amounts likely to be required, which proved very excessive. The checking of rinderpest was accomplished more quickly and with a smaller expenditure of serum than had been anticipated, while the appearance of cholera necessitated the employment of every available man for its suppression and greatly interfered with the work of public vaccinating, and the call for vaccine virus has correspondingly diminished.

If in estimating the value of work performed the value of vaccine virus, rinderpest serum, mallein, and cholera vaccine is fixed at the lowest wholesale price at which these articles could be purchased the cost of the amounts actually furnished the different bureaus and offices by the bureau of science during the year would be ₱170,382, as against ₱48,081.08, for which amount credit is taken in estimating the value of work performed. In other words, the actual cash value of the work performed by the bureau of science for other bureaus of the government and for provinces, municipalities, and private persons, if the supplies produced and furnished by it were estimated not at the actual cost of production but at the lowest wholesale price at which they might be purchased, was ₱325,627.32.

This estimate does not take into account the considerable amount of vaccine virus and rinderpest serum which the bureau must keep in stock in order to have a margin of safety on which to meet sudden and unexpectedly increased demands. The value of this additional supply should in reality be taken into consideration, because if the government did not manufacture it it would have to purchase it and carry it in stock.

It is certainly not too much to say that the cash value, on a commercial basis of work and supplies called for by other bureaus of the insular government, by provinces and municipalities, and by private persons, is fully equal to the total cost of operation, so that the large amount of important independent investigation which the bureau carries on as a part of its regular work may be regarded as practically a bonus.

THE BUREAU OF LANDS.

The surveying, leasing, and sale of the friar lands and the increased amount of work in connection with mining claims, free patent claims, homestead claims, and the sale and leasing of public lands have necessitated a radical increase in the force of the bureau of lands and the complete reorganization of the bureau.

Its former chief, Mr. Will M. Tipton, resigned on account of poor health, and Mr. Charles H. Sleeper was appointed to succeed him. An assistant director was also provided for, and Mr. J. R. Wilson, formerly clerk of the court of land registration, was appointed to this position. The old quarters of the bureau having become inadequate to meet its needs, it was transferred to adequate quarters in the Oriente Building.

FRIAR LANDS.

The work on the friar estates has advanced rapidly. By the transfer of the Biñan, Calamba, Lolombay, Santa Cruz de Malabon, Santa Maria de Pandi, and the Santa Rosa estates from the Philippine Sugar Estates Development Company (Limited), the government came into possession of all the friar estates enumerated in the four executory contracts entered into with the Dominicans, Franciscans, Augustinians, and Recoletos on December 22, 1903. The deeds of these estates were immediately recorded in the bureau of lands, and in accordance with the provisions of act No. 1120, were registered with the registrars of deeds in the provinces where they are respectively located. They will be registered in the court of land registration as rapidly as surveys can be completed. The San José estate in Mindoro is already so registered, and the estates of San Marcos, Binagbag, Dampol, and Guiguinto will be in the near future.

In the report of the director of lands (Appendix E) will be found a table showing the estates purchased, their location, the grantees, the date of conveyance, the area, and the purchase price; a table showing the station of each of the agents employed in the administration of these estates, the number of estates each agent administers, their titles, area, and the date of the first lease executed; a table showing for each estate the progress made during the year in leasing, the annual contracted rental, and the revenue collected during the fiscal year; a table showing the expenditures made by the bureau of lands on account of friar lands; and a table showing the progress of surveys on friar lands to June 30, 1906. The number of approved leases issued during the year was 18,770. The total area leased was 29,625 hectares, 18 ares, and 28 centares. The annual contracted rental for the territory covered by leases is ₱205,885.47, and the amount actually collected during the year was ₱98,661.30.

In fixing rentals the first object has necessarily been to obtain the attornment of the occupants. The rates in most cases are lower than those paid to the friars, but if a large proportion of each estate could be leased on similar terms the income would be sufficient to pay the interest upon the bonds and the cost of administration.

The San José estate in Mindoro is practically without occupants and the only revenue derived from it at present comes from the leasing of grazing privileges to the Recolecto friars.

On the Talisay-Minglanilla and Banilad estates no revenue has yet been collected, leases having been issued so late that the first payments were not due before the end of the year. In the case of the Isabela estate, rentals are payable semiannually and have not yet fallen due.

Many and varied obstacles were encountered in leasing the land on several of the estates, but all of these have now been overcome and the work is progressing rapidly and satisfactorily.

As survey work is completed and the temporary leases, all of which have been executed for a period of one year, expire, new leases will be issued. On several of the estates the surveys have already been finished and values fixed, so that sales may begin at once.

The director of lands deems it probable that the Matamó, San Marcos, Binagbag, Dampol, and Guiguinto estates will have been disposed of by the first of January; that all of the Orion estate will be sold during the second half of the fiscal year, and that a beginning will be made in the sale of the Biñan and the Santa Rosa estates.

On six estates buildings of various kinds were found. They had, however, been abandoned for ten years and the damage caused by the elements and by vandals had resulted in great deterioration. Many minor repairs have been made on these buildings.

Eight estates have very extensive irrigation systems. All of the large dams are in a fair state of preservation. Most of the smaller secondary dams were found to be in a deplorable condition, while practically all of the numerous long tunnels leading from the main dams and many of the main and secondary distributing canals were filled up to such an extent as effectually to prevent the passage of water. In September, 1905, a competent and experienced man was employed to take charge of the distribution of water on the several estates, to oversee the cleaning of canals and ditches, and to superintend minor repairs. A number of ditch tenders were also employed and substantial progress has been made toward the reestablishment of the various irrigation systems, but the havoc wrought during ten years of abandonment has been great and the work of reconstruction can not be entirely completed for some time.

PUBLIC LANDS.

In the last annual report of the secretary of the interior attention was called to the insignificant importance of the transactions in public lands and the very small number of applications for free patents, homesteads, and for leasing or purchasing public lands which had been received. It was believed that this condition of affairs was due in no small degree to the ignorance of the common people as to the provisions of existing law, and a vigorous campaign of education was entered upon. During the year some 52,000 pamphlets and circulars covering every feature of the public-land laws have been prepared, printed in Spanish and in the more important native dialects, and circulated. There has also been printed and circulated a "public-land primer" containing simple but comprehensive statements of the facts which a person desiring to make application for free patent or to lease or purchase public land should know. These pamphlets are designed for use in the public schools and for distribution among the more ignorant people.

Act No. 1404 provides that provincial treasurers shall act as land officers. This establishes at least one local land office in each province, which is a great convenience to the public.

On June 30, 1906, there were 805 homestead applications on file, 578 of which had been received during the year. As many persons who desire to make homestead applications can not perform the clerical work required by law, and as it was ascertained that in many instances those who had prepared applications for them had

charged exorbitant fees, municipal secretaries have been required to make out such applications free of charge.

There were received 62 applications to purchase public land. Of these 3 were rejected, 10 withdrawn, and 1 canceled. Thirteen sales have been advertised, but as yet none have been made. Most of these applications are for very small tracts.

There were 5 applications to lease public lands, but no lands have yet been leased.

The total number of free patent applications thus far is 730, of which 590 were made during the year; of these 92 were rejected, 20 withdrawn, and 163 returned for correction. The remainder await survey and final action.

During March, April, and May a part of the town site of Baguio was subdivided into residence and business lots, which were offered for sale at public auction, in accordance with the provisions of the public-land act, on May 28, 1906. Although this sale took place at Baguio in the midst of a typhoon, which prevented the arrival from Manila of many persons who desired to purchase, 91 residence and 15 business lots were sold. At a subsequent sale held in Manila all of the remaining lots were disposed of. It will be necessary in the near future to subdivide and offer for sale a large additional portion of this town site. The Commission has, by resolution, provided that the proceeds of the sale of lots at Baguio shall constitute a fund to be expended for improvements in or near the town site.

Three hundred and sixty-seven notices have been received from the court of land registration relative to applications for registration of title under the provisions of Chapter VI of the public-land act. The attorney-general has been requested to enter appearance in 97 cases and to enter opposition in 54. In small and doubtful cases it has seemed better to have him enter an appearance, in order that default may not be taken against the government, rather than enter an opposition which might entail upon impecunious applicants the needless payment of attorney fees. This method of procedure is resulting in a large increase in the number of applications presented to the court. In most of the cases where oppositions have been ordered, persons were attempting to secure large tracts of unoccupied and uncultivated public land to which they had no legal or moral right.

It is impossible to make a statement relative to mining claims filed during the year because of the almost universal failure of provincial secretaries, who are mining recorders, seasonably to submit their reports. This same difficulty was encountered at the time the report of the Secretary of the Interior for the fiscal year ending June 30, 1905, was written. Full data for that year are now available, and it appears that the total number of claims filed was 419, distributed as follows: Gold claims, 295, of which 232 were lode claims and 63 placer claims; copper claims, 3; iron claims, 6; coal claims, 77; marble claims, 1; limestone claims, 5; plaster claims, 3; guano claims, 7; petroleum claims, 23. They were distributed by provinces as follows: Ambos Camarines, 154; Albay, 11; Batangas, 10; Bulacan, 6; Cebu, 39; Laguna, 3; Lepanto-Bontoc, 41; Masbate, 57; Mindoro, 10; Misamis, 2; Pangasinan, 16; Rizal, 8; Romblon, 1; Surigao, 6; Tayabas, 55.

SURVEYING.

At the beginning of the year the bureau had but four survey parties. Of these two were employed on friar lands, one was surveying coal claims and one placer claims. Owing to scarcity of surveyors it was not until November that additional men could be secured. At the close of the year there were actually at work nine friar-land surveying parties, one mineral-land surveying party, two parties engaged in work for the court of land registration, and one free-patent surveying party. A further large additional surveying force has been authorized for the fiscal year 1906-7, and will be organized as rapidly as possible.

Full details of the survey work already accomplished will be found in the report of the director of lands (Appendix E).

A most important step calculated to decrease the cost of public-land surveys and to facilitate the surveying operations of the government, as well as those of private individuals, has been the establishment by the bureau of lands, working in conjunction with the bureau of education, of a practical school of instruction in surveying for Filipino students. Every effort will be made to give the young men who desire to pursue this course a thorough and practical education in surveying, and it is hoped that in this way a great public need may be met.

A strong effort has been made to expedite the surveying of friar lands. Forty-eight thousand two hundred hectares have been surveyed at the close of the year. The cost of these surveys was ₱3.35 per hectare, or ₱1.34 per acre. The large number of small parcels of land with very irregular boundaries found on many of the estates greatly increases the cost of field work and computation. On town lots a party of two competent surveyors has been able to average 143 hectares per month; on rice and sugar land a party of the same size has slightly exceeded 175 hectares per month.

SAN LAZARO ESTATE.

Upon the recommendation of the director of lands, the duty of collecting rents upon the San Lazaro estate was, on April 1, 1906, transferred to the bureau of internal revenue. This arrangement has proved advantageous. A surveyor has been detailed for platting the blocks of the estate and a map has been prepared showing the details of its subdivisions. The surveys of 41 blocks out of a total of 59 have been completed.

The suits against Messrs. Martinez, Cenjor, and Velasco, which have been referred to in previous reports, have been concluded, the supreme court finding in each case that the lease which was the basis of the litigation was not void but was good for a period of six years only. A new lease was entered into with N. T. Hashim, subtenant of Martinez, for a term of six years upon a reduced area, at a yearly rental of ₱2,600 instead of ₱400 previously paid for the larger area. Arrangements have also been completed for a new lease to Velasco for a term of six years for approximately the area covered by his previous lease, at a yearly rental of ₱1,460 instead of ₱151. The third case seems likely to terminate in ejectment proceedings, as the lessee has neither paid the delinquent rent nor signed a new lease.

The total amount of rents received from the estate was ₱50,243.75, as against ₱43,488.39 for the previous year, an increase of nearly 16 per cent.

The delinquent rent roll on June 30, 1906, amounted to ₱12,511.65. More than half of this amount will doubtless be collected during the first quarter of the new fiscal year.

The right to administer the San Lazaro estate is in litigation. Under the regulations at present in force leases can not be issued for a longer period than six years, and it has not been deemed desirable to change these regulations without the approval of the archbishop of Manila, who is endeavoring to establish in the courts his right to administer the estate. Tenants are obviously not justified in erecting substantial and costly buildings on the strength of six-year leases. If a satisfactory agreement can be reached with the archbishop, the income from this estate should increase to at least ₱100,000 per annum.

FINANCIAL STATEMENT.

The receipts and expenditures of the bureau of lands for the fiscal year ending June 30, 1906, were as follows:

<i>Receipts.</i>	
Friar lands, rents.....	₱98, 673. 08
San Lazaro estate, rents July 1, 1905, to March 31, 1906.....	34, 199. 25
Public lands:	
Sale coal lands.....	₱3, 461. 60
Liquidated homestead fees.....	1, 200. 00
First Baguio town-site sale.....	9, 472. 14
	<hr/> 14, 133. 74
Miscellaneous receipts:	
Certified copies of records.....	209. 68
Cost of surveys (liquidated).....	709. 76
	<hr/> 919. 44
Receipts in suspense:	
Sale of coal lands.....	12, 800. 00
Advances on surveys.....	4, 200. 00
Homestead fees.....	1, 050. 00
	<hr/> 18, 050. 00
Total receipts.....	<hr/> <hr/> 165, 975. 51

<i>Expenditures.</i>	
General office.....	₱45, 989. 80
Public lands.....	28, 208. 71
Surveying and drafting.....	27, 669. 28
Friar lands.....	131, 377. 10
San Lazaro estate.....	8, 191. 99
Total expenditures.....	<hr/> 241, 436. 88

A very complete statement of the operations of the bureau of lands during the year will be found in the report of the director (Appendix E).

THE BUREAU OF AGRICULTURE.

It was deemed best to send the director of agriculture, Mr. W. C. Welborn, to the United States in order that he might appear before Congressional committees and give information relative to agricul-

tural conditions in the Philippines. This necessitated his absence from the islands for a period of eight months, during which time the affairs of the bureau were conducted in a very satisfactory manner by the assistant director, Dr. G. E. Nesom.

SEED AND PLANT INTRODUCTION.

With increased experience more satisfactory results have been obtained from seed distribution, the necessity of thoroughly testing the germinating powers of seeds on arrival and of sending them out as speedily as possible in order that they may be planted before their vitality has been impaired having been made evident. Some 2,000 applicants have been supplied, the aggregate of seeds sent out being 2,500 pounds of field seeds and 20,000 packets of garden seeds. About 58 per cent of the applicants were Filipinos and 42 per cent were of all other nationalities. A large amount of seed was furnished American teachers to be used in school gardens, which are being quite generally established, with beneficial results.

The opening of the oil mill of the Philippine Products Company at Manila creates a steady demand for oil-producing seeds, for which this company offers to pay the world's market price. It is particularly desirous of securing sesamum in large quantities. Sesamum, known in the northern provinces as lingá and in the Visayan provinces as jonjuli, was formerly grown in these islands in some quantity, but its cultivation has been largely abandoned, owing to the fact that there was no fixed market for it. Under Philippine conditions of soil and climate it produces very heavily and matures in about six weeks. It may be planted on rice land after the annual rice crop has been harvested. The variety ordinarily cultivated in the Philippines has black seed. About 1,000 pounds of an improved white-seeded variety have been distributed gratuitously, as has a considerable amount of improved sugar cane. One hundred bushels of Carolina golden seed rice have also been imported and used chiefly for free distribution.

Largely through the efforts of the bureau of agriculture great interest has been aroused throughout the archipelago in the cultivation of maguey. The suckers and pole plants from the maguey growing cultivated or wild throughout the provinces are now being largely used to make new plantings, but as the leaves of the Philippine variety have strong thorns along their borders, which make them hard to handle, and as their percentage of fiber is lower than is that in leaves of the Hawaiian variety, 200,000 plants were ordered from Honolulu, to be sent in lots of 50,000 each. Two of these lots have already arrived and the plants, which were in excellent condition, have been distributed chiefly to provinces like North and South Ilocos and Bohol, where a large amount of maguey is already grown. There are more than 400 applications now on file from governors of provinces, plantation owners, and other responsible persons for additional plants.

It seems probable that the 200,000 originally ordered, together with an additional 20,000, the ordering of which has since been authorized, will prove insufficient to meet the demand.

In view of the rapidity with which the maguey plant reproduces itself, the importation of approximately a quarter of a million

improved plants and their distribution to responsible persons who will care for them properly can not fail to exercise a great influence on the future of the maguey industry in these islands.

IMPROVEMENT OF NATIVE VEGETABLES.

There are a considerable number of strong-growing native vegetables, chiefly legumes and cucurbits, which are of excellent quality and are undoubtedly capable of great improvement, as they have heretofore been raised practically without cultivation. One of the most remarkable of these is a legume with pods which sometimes measures 30 inches in length, 2 inches in width, and one-half inch in thickness. They are prepared for the table like string beans, and in spite of their great size are most tender and palatable. Systematic cultivation and improvement of a number of these native vegetables is being carried on at Singalon with good reason to anticipate very satisfactory results.

INTRODUCTION OF A COFFEE WHICH RESISTS BLIGHT.

Three years ago a plantation of the variety of Brazilian coffee known as the Naragogyne hybrid was started at Lipa, in the province of Batangas, with a view to determining the possibility of reestablishing the once important coffee industry of that province, which had been ruined by borers and by the coffee blight known as Hemeleia. The bushes on this plantation are now fruiting heavily and show no signs of infection with Hemeleia, although Arabian coffee bushes in the same neighborhood are badly affected and Hemeleia has attacked practically all of the mountain plantations in Benguet and Lepanto-Bontoc.

It has been claimed that this Brazilian variety is lacking in productiveness, but 3-year-old bushes at Lipa and Manila are producing one-third of a pound each per year. Hemeleia at one time practically ruined the coffee industry of Java, but it was reestablished by planting robust varieties which resisted the blight. It is confidently anticipated that the same thing may be done here, and present indications are that the variety above named will solve the problem.

BROOM CORN.

In the last annual report of the secretary of the interior attention was called to the practicability of growing broom corn here. Corn brooms and brushes to the value of \$10,000 or \$15,000 are imported annually. American broom-corn seed planted in the dry season grew splendidly, giving a yield about equal to the Illinois average and producing a good, straight, green-colored brush. As a result a company has already ordered an outfit for broom making and should have no difficulty in establishing a small but profitable business.

NEW FIBER PLANTS.

Indian hemp, sunn hemp, and ramie hemp have all been introduced within the past year and have made good growth. With the abaca industry firmly established, the maguey industry rapidly growing in

importance, and the possibility of growing Indian hemp, sunn hemp, and ramie hemp established, the value of fiber exports from these islands should increase very greatly within the next few years.

SORGHUMS.

Sweet sorghum and Kaffir corn were unknown in these islands until introduced by the bureau of agriculture two years ago. They grow with ease, yield abundantly, and are now being largely produced for forage. Kaffir corn has great drought-resisting qualities and produces a grain which compares with rice or Indian corn in nutritive value. Rice land devoted to this grain during the dry season would produce more food than it does in rice during the wet season, and the general introduction of this valuable plant is greatly to be desired.

SUGAR CANE.

Five leading varieties of sugar cane, imported from Honolulu, were planted at the Singalon station. They made splendid growth, but the large size attained resulted in the almost complete ruin of the plantings by the great typhoon of September 26, 1905. It now seems that in most of the islands, on account of the danger of typhoons, it will be undesirable to attempt to stimulate extraordinary growth of sugar cane by irrigation and fertilization, as there will be great danger that crops would be ruined by violent storms of wind and rain.

HEMP-CLEANING MACHINES.

Active efforts to produce a satisfactory hemp-cleaning machine have continued. The director of agriculture calls attention to the fact that manila hemp, or abaca, which is grown without the use of the plow and is hardly ever weeded, requires but two to three years to reach maturity, and that the gross average value of the crop per acre is twice that of the cotton crop of the United States and nearly four times that of an acre of wheat. There are immense areas capable of producing the best abaca which are not under cultivation, a limit being set at present on its production by the number of men who can be obtained to clean the fiber. The physical labor involved in this work is so great that comparatively few laborers are willing to undertake it, and the average amount cleaned per laborer per day will hardly exceed 20 pounds. The bureau of agriculture has done all in its power to aid and encourage inventors and has even sent abaca stalks to England and America for trial in machines.

Very satisfactory results, so far as concern character of cleaning, obtained with the old Mexican raspador led the director of agriculture to devise a machine of which two scutching wheels similar to the wheel of the raspador and the scutching wheels of modern maguey-cleaning machines were one of the essential features. A completed machine of this type has very recently been received at Manila and is now being finally adjusted preparatory to severe field tests. The results thus far obtained with it are highly encouraging. Its weight is such that it can not be taken to the smaller plantings on steep hillsides, but the large amount of fiber saved, which is wasted by present methods, will justify considerable expenditure for transportation of stalks.

The director of agriculture calls attention to the fact that sugar cane, ordinary timber in the log, and sisal leaves all have about the same value per ton as have abaca stalks and that all of them are usually transported a considerable distance to central mills, while the handling of abaca stalks is facilitated by the fact that each one makes a convenient one-man load, weighing about 50 pounds, and that they float perfectly in water, so that they can be flumed or rafted down rivers.

A further argument in favor of a central plant is the great value of the waste for paper-making purposes. Under existing conditions this waste is produced in such small quantities at each point where made that its commercial handling is hardly practicable, but the waste from a large central cleaning plant would be a very valuable product.

The Lindsay hemp-cleaning machine, of which much was hoped, did not prove a commercial success. Too much power was required to turn the friction rolls which drew the fiber strips under the knife and cleaned fiber was not produced in sufficient quantity. Mr. Lindsay has now perfected a working model of another machine, with a short pull, based upon an entirely different principle, and has gone to the United States in order to secure patents. A number of other competent mechanics are working upon this problem, and its successful solution seems certain.

ABACA PLANTING.

Abaca planting is being carried on very extensively in many of the provinces, especially in the district of Davao, in the Moro Province, where 35 American plantations have been started and 3,500,000 plants are now growing. The demand for young plants is very large and the bureau of agriculture has planted a large quantity of abaca seed with a view to meeting it.

WORK OF THE TRINIDAD STATION.

The work of this station, situated in the Trinidad Valley in the province of Benguet, at the height of some 4,500 feet above sea level, has been greatly facilitated by the opening of a cart road to Baguio, which makes it possible to obtain from the latter place a good supply of manure, from the lack of which the station has heretofore suffered.

The land has been largely planted in forage crops in order to save the great expense of hauling hay for the stock farm at Baguio, and in vegetables to supply the local Baguio demand.

Strawberries have been successfully raised for the first time during the present season. Oats, wheat, and barley grow well, but display a tendency to make leaf and stalk at the expense of grain. With a view to overcoming this and some other difficulties, Mr. C. H. Petrelli, the plant breeder of the bureau, was sent to Trinidad and has since been placed in charge of the station. Mr. Petrelli is working with the grains above mentioned and with rice, with a view to obtaining better varieties than those at present grown. He has begun a series of interesting experiments in the hybridization of wild varieties of raspberries and other small fruits with a view to their

ultimate improvement, and is grafting improved varieties of lemon and orange onto Philippine citrus trees.

Red clover grows very well at Trinidad, but there are no insects there capable of fertilizing it. Efforts to obtain bumble bees from the United States during the last winter season were unsuccessful. It is believed, however, that they can be obtained during the present year.

LA CARLOTA ESTATE.

Some 200 acres of this estate are under cultivation in sugar cane and 100 additional acres in forage and other crops. The old mill built by the Spaniards on this estate will not handle more than 200 acres of fairly good cane. Although the expense of growing cane was materially lower last year than the year before, the price of sugar was such that the product did not pay the cost of production.

Last year's crop contained a good deal of first ratoon cane and some of this was saved for second rattoons, but a part of it did so poorly that it was plowed up, and the balance is unpromising. Negros planters are seldom able to grow more than one reasonably good ratoon crop.

The director of agriculture calls attention to the fact that with mills such as those which at present exist in the Philippines, and which Java and Cuba discarded forty years ago, there is no profit nor hope of profit from the Philippine sugar industry, and that practically the only possible way of changing existing methods is for the government to establish a modern mill, as there is no reason to believe that private capital is likely to enter upon such an enterprise.

MURCIA RICE FARM.

The rice farm at Murcia, Tarlac having served its purpose in an experimental way and not being suited to the raising of rice on a commercially profitable scale on account of the barrenness of the soil and the rolling nature of the land, has been discontinued, but not before results of great importance to the rice growers between Manila and Dagupan were obtained. The advantages incident to steam thrashing were first demonstrated at this place, and as a result a considerable number of steam thrashing outfits have been purchased and are now in operation.

The wisdom of the Filipino in sowing his rice in seed beds, and transplanting it after it has attained a considerable size, has been conclusively demonstrated. His land is poorly prepared, and if his rice is scattered broadcast over it the young seedlings are promptly killed by coarse grasses and weeds, whereas the larger plants at the time of transplanting have a sufficient start over the weeds, so that they are able to hold their own. The trouble with this method, however, lies in the amount of labor necessary to plant a comparatively small area. It was found that by sowing rice in drills 15 to 20 inches apart, so as to facilitate weeding, crops could be obtained which were nearly as heavy as those secured by transplanting. If the rice is drilled in, large areas obviously can be planted during the comparatively short season.

It has been found that crops planted in May or June ripen no sooner than those planted in August or September, but that the early

plantings give a vastly better yield than do the later ones. It now seems probable that, with artificial irrigation, seed might be put out at least a month earlier than is the general practice at present, without maturing a crop before the close of the rainy season.

There is little doubt that the Philippine rice fields would yield 25 per cent more than they do at present were they kept clear of grass and weeds during the growing season, and circular letters have been sent to the governors of all important rice-growing provinces calling attention to the necessity of convincing the farmers that they should weed their rice. A number of governors have displayed a keen interest in this matter and have not only issued proper instructions to municipal officials, but have themselves gone to inspect the rice fields and urged the people to keep them clean.

It is hoped that a sufficient number of planters will interest themselves in this matter to at least give numerous practical demonstrations of the importance of weeding, so that next year there may be noticeable improvement in the care given the fields, with a corresponding increase in the crop.

The importations of rice during the year just ended were far less than for any previous year since American occupation. Scanty rainfall has seriously imperiled this year's crop in many of the provinces, but if rain comes before irreparable damage has been done it is believed that its crop will be nearly sufficient to meet the needs of the islands.

Full details as to the experimental plantings of rice which have been made and the results in each case will be found in the accompanying report of the director of agriculture (Appendix F).

The best yield was obtained on land which had been fertilized with 600 pounds of tobacco waste to the acre, from the Manila factories, and was at the rate of 2,900 pounds of unhulled rice to the acre. This experiment showed that a large amount of valuable fertilizer is going to waste at the Manila tobacco factories.

As a result of the practical demonstrations at Murcia, a considerable number of steam-plowing outfits have been purchased and put into operation. The results obtained seem to have been uniformly satisfactory. The cost of plowing land by steam has varied from ₱2 to ₱6 per acre, the difference depending chiefly upon the ease or difficulty with which fuel and water were secured.

The great weight of steam-plowing outfits is the chief obstacle to their introduction. Two machines for use in eastern Negros lay in Manila many months before they could be shipped, and the landing of heavy machinery at ports where there are no piers and no large lighters is necessarily a matter of great difficulty.

In its efforts to secure a lighter plowing outfit, the bureau of agriculture has experimented with a kerosene-explosion engine weighing only 2,800 pounds. This engine develops plenty of power, but thus far has proved unreliable in its action. The agents maintain that the difficulty is due to defects in the sparking device and can readily be remedied. Should this engine prove successful it would fill a great need, as its lower cost would put it within the reach of many persons who could not afford to purchase a large steam-plowing outfit, and its small weight would facilitate its passage over bad roads and weak bridges.

DIVISION OF ANIMAL INDUSTRY.

Under the provisions of act No. 1407, the veterinary corps was transferred from the bureau of health to the bureau of agriculture on October 19, 1905, and in the latter bureau a division of animal industry was established, which included not only the work of veterinarians in the inspection and control of animal diseases, but the work of the stock farm at Baguio, where experiments are being conducted in the breeding of horses, cattle, sheep, goats, and hogs; horse breeding throughout the islands by the use of improved sires imported by the bureau of agriculture and loaned to the provincial governments and private persons, and the dairy farm at Manila.

When this work was taken over a severe outbreak of rinderpest prevailed in western Negros, and another existed in the province of Zambales. Inoculation by the simultaneous method was used in Zambales with complete success, the mortality among the inoculated animals being extremely low, and complete immunity being obtained. The same method was employed at the outset with equal success in Negros, but after a short time an extraordinarily high mortality developed, which necessitated the immediate dispatch of an employee of the bureau of science in order that the cause might be ascertained. It proved to be due to the prevalence of surra in the infected herds. Carabao infected with surra may continue to live and work for years, but while inoculation by the simultaneous method of healthy animals is attended ordinarily with a loss of but 3 or 4 per cent, costly experience in Negros abundantly demonstrated the fact that the same method employed on animals infected with surra caused a loss of approximately 50 per cent.

As the surra infection proved to be general in the towns north of Bacolod, it was obviously impracticable to use the simultaneous method there, and serum alone was employed. It has proved a very simple matter to stop an epidemic of rinderpest with serum, but the immunity thus conferred is transient, lasting at the best but two or three months. After the disease had been fully controlled in Negros an effort was made to interest some of the more important hacenderos of the province in the establishment and maintenance, for their own protection, of a cattle quarantine. This province imports carabao and cattle from all over the archipelago, and the fact was pointed out that rinderpest would inevitably be reintroduced unless adequate quarantine measures were adopted. Such measures could be made effective only through the cooperation of the people themselves, as carabao can be landed at almost any point on the west coast of Negros. It proved impracticable to awaken the slightest interest in cattle quarantine, and as a result the disease has again been introduced, has caused serious damage, and must once more be stamped out.

The islands were almost free from rinderpest from January to July. With the oncoming of the rainy season outbreaks have occurred at a number of widely separated points, but have been promptly controlled as soon as men could be got on the ground.

In the province of Batangas, distant but half a day's journey from Manila, the disease prevailed for two months, and more than 500 head of cattle died before it occurred to the governor to advise the bureau of agriculture. The few men available were immediately

dispatched to the scene of trouble, and the results were so satisfactory to property owners that the governor sent an urgent telegram requesting that 20 more inoculators be sent at once.

The treatment with serum of animals actually sick of rinderpest has resulted in the saving of approximately 70 per cent of those treated. As a result of the checking of rinderpest by inoculation the supply of cattle and carabao is steadily increasing. Little by little the people will learn the necessity of promptly informing the director of agriculture when the disease appears in any given locality, and there would seem to be no good reason why it may not ultimately be eliminated as a serious cause of death among cattle in the Philippines.

PORT AND CITY INSPECTION OF ANIMALS.

All animals arriving at Manila are inspected for contagious disease. During the period from November 1, 1905, to June 30, 1906, 62,170 animals were examined. Of these 21,470 were from foreign ports and 40,700 from interisland ports. One thousand two hundred and twenty-two animals were also inspected prior to shipment to the provinces. Six thousand two hundred and thirty-nine were examined for surra or glanders. Thirteen thousand two hundred and twenty-two cattle and 35,340 hogs were inspected at the public abattoir, where a large number of animals and parts of animals were condemned as unfit for human food and were ordered cremated.

A systematic inspection of the stables of the city carried on from January 1 to June 1 shows that Manila is now more free from contagious diseases of animals than at any time since American occupation.

STOCK FARM AT TRINIDAD.

Experiments in raising stock at Baguio having passed the experimental stage and resulted successfully, permanent buildings for the stock farm, consisting of a cottage for the superintendent, a large barn for horses, a small barn for ponies and burros, a blacksmith shop, wagon shed, cattle barn, and quarters for laborers, have been constructed in a small valley opening off from the main valley of Trinidad. It is well sheltered from severe windstorms, is abundantly supplied with good water, and the feed there remains green when the surrounding country is badly dried up.

About 120 acres have been fenced in. A good level road connects the stock farm with the experiment station, and renders easy the carting of manure from the stock farm to the station and of fodder from the station to the farm.

While the animals owned by the bureau of agriculture and kept at other places have suffered severely from disease, those at Baguio have been singularly free from contagious troubles of any sort.

Particularly good results have been obtained from breeding the Arab stallion "Bedr" to native mares, improvement in the colts over those sired by native stallions being very marked. The Igorots were afraid that mares bred to this and to other stallions at the farm would have trouble in foaling, but such has not been the case, and they are now convinced that their fears are groundless, so that mares will doubtless be brought in increasing numbers. Chinese and native

cattle have been bred to Galloway, Jersey, and Shorthorn bulls. The calves show a decided tendency to follow the type of the bull rather than that of the dam.

The only important loss among animals at the Baguio stock farm occurred during the severe typhoon of May 18, 1906, when 1 cow, 8 burros, and 11 burro colts were drowned in the swollen streams which filled the canyons in which they were grazing. The new stock farm is so located that the drowning of animals is hardly possible.

Eleven stallions have been distributed through the provinces during the year. Some of them have had little service, while some of them have had a great deal. When it was found that a stallion was not getting much work in a given place he was removed to some other locality, the demand for stallions always exceeding the supply.

DAIRY FARM.

Efforts to build up a dairy herd have continued, and during the year 10 cows with calves, 7 yearling heifers, 11 calves 2 to 6 weeks old, 5 young bulls, and 22 heifers 5 months to a year old have been purchased, previous experience having made it seem very probable that the best way to build up a dairy herd was to purchase young animals, which can be more safely immunized against Texas fever and rinderpest than can older ones. Seven heifers from Townsville, Australia, were immune to Texas fever on arrival, and all of them were successfully immunized against rinderpest. Ten cows and calves from Sydney were not immune to Texas fever. They were inoculated against this disease with a loss of 1 cow, and after some losses from other causes the remaining animals were successfully immunized against rinderpest. Eleven young calves of Australian stock were purchased from a dairymen in Manila. It was necessary to feed them on canned milk. On this diet they became thin, and 3 died of gastritis. The remaining 8 were successfully inoculated.

The immune dairy herd now comprises 1 bull, 26 cows and heifers, 12 yearling bulls, 18 young heifers, and 7 heifer calves, making a total of 64 head. All the cows and yearling heifers have been bred, and within a few months 20 or more cows will be in milk.

When once immunized imported cows do well here, and the yield of milk averages rather larger than with good dairy animals at home.

The land at present occupied by the dairy farm is unsatisfactory, being full of old quarry pits which fill with water during the rainy season, so that there is danger that cattle will drown. It is also badly infested with ticks, and much of it at times becomes very muddy. Negotiations for a good piece of land in the foothills near Antipolo, on a branch of the Manila and Dagupan Railway, are in progress, and it is anticipated that the farm will be removed to this location within a few months.

At that time the care of the serum animals of the bureau of science will be turned over to the bureau of agriculture, and they, too, will be transferred to the new farm. This change will result in material saving on salaries of employees and cost of feeding animals.

HOGS.

As stated in a previous report, Berkshire hogs can be crossed very successfully with native swine, and the demand for boars has constantly far exceeded the supply. Ten additional Berkshire hogs have been imported and a number have been raised. Many have been distributed through the provinces. The herd now numbers 46 head. They have been remarkably free from disease and have done very well.

The new dairy farm will afford adequate space for the raising of hogs, which has heretofore been lacking. Cocoanut cake for feeding can now be had in any desired quantity from the Philippine Products Company, and vigorous efforts will be made to supply the constantly increasing demand for Berkshire hogs which is coming from all over the islands.

FINANCIAL STATEMENT.

Expenditures.

General office expenditures.....	₱80,822.89
Singalong experiment station.....	24,083.98
La Trinidad experiment station.....	9,292.21
Batangas experiment station.....	952.17
Cullion stock farm.....	2,319.65
Santa Cruz rice farm.....	3,571.52
San Ramon cocoanut and hemp farm.....	4,066.21
Lamao forest station.....	5,901.79
Murcia rice farm.....	38,062.68
La Carlota sugar farm.....	21,362.95
San Juan dairy farm.....	9,701.61
Baguio stock farm.....	26,075.56
Veterinary division.....	58,679.68
Lipa coffee station.....	163.20
Total expenditures.....	285,056.10
Total amount appropriated by act No. 1416.....	322,800.00

Receipts.

Office, miscellaneous.....	₱134.86
Singalong, sale of vegetables.....	1,306.22
La Trinidad, sale of vegetables.....	394.35
Batangas, sale of vegetables (to Army).....	213.38
San Ramon, cocoanuts, copra, and hemp.....	4,869.09
Lamao, shrubbery, etc.....	889.18
Murcia, rice and straw.....	10,747.44
San Juan, milk.....	436.85
Veterinarians, inspection of live stock.....	9,830.90
	28,822.27
Total expenditures.....	351,622.27
	285,056.10
Unexpended balance.....	66,566.17

Full details of the work of the bureau of agriculture may be found in the annual report of the director (Appendix F).

THE WEATHER BUREAU.

There is of necessity little variation from year to year in the work of the weather bureau, which has continued, as heretofore, to render efficient service and to safeguard life and property in the Philippine Islands and on the neighboring Asiatic coast by sending out timely warnings of the approach and probable course of typhoons. The inhabitants of Manila were seasonably advised of the approach of the destructive typhoon of September 26, 1905, and the resulting loss of life and property was thus reduced to a minimum. A lesson was learned from the interruption of ordinary means of communication at this time by the falling of telephone and telegraph wires, and an arrangement has since been made with the municipality of Manila by means of which the police and fire-alarm system of the city will hereafter to be used to spread news of the approach of dangerous storms, and the individual members of the police will be sent from house to house to warn property owners to take necessary protective measures. This is especially important in the so-called "nipa districts," where native houses of light materials frequently can be saved from destruction if warning is given in sufficient time to make possible the bracing of houses and the weighting down of roofs.

At the time of the above-mentioned storm there was practical evidence of the appreciation in which the weather service is generally held. The government telegraph lines to the south having been interrupted and seriously injured, the Eastern Extension, Australasia and China Telegraph Company (Limited) transmitted free of charge weather dispatches from all points reached by their lines until those of the government were rebuilt.

The Commission had evidence of the fact that the statement of the position and prediction of the course of typhoons have become almost an exact science, while at Baguio in May, being twice warned twenty-four hours in advance of the approach of typhoons which struck that place. Twenty-three special typhoon warnings were sent to China and Japan during the year. Three hundred and fifteen barometers were examined and corrected if necessary.

ASTRONOMICAL DEPARTMENT.

The astronomical department has continued its work of furnishing standard time and of observing sun spots in connection with magnetic observations.

Thirty-nine chronometers were compared and rated, and on two occasions chronometers belonging to cable ships lying in the harbor of Guam were compared by cable.

SEISMIC DEPARTMENT.

The seismological instruments have recorded 10 local earthquakes at Manila, 2 of which were severe enough to cause some alarm among the inhabitants, although they did no damage. The seismological instruments at provincial stations recorded 141 perceptible quakes, none of which resulted seriously. Of the 274 microseismic disturbances registered on the Vicentini instrument at the Manila Observa-

tory, 59 were due to earthquakes in the archipelago, 33 to far-distant earthquakes, and the rest were pure microseismic tremors. The earthquake at Colombo, whose center was a distance of 11,180 statute miles, and that which resulted in such dreadful destruction at San Francisco, distant 6,950 statute miles, were both recorded.

MAGNETIC DEPARTMENT.

Attention was called in the last annual report of this office to the complete interruption of magnetic work by the establishment of electric street car lines in Manila. The Jesuit mission has purchased land at Baguio, Benguet, on which it will erect a rest house, and would transfer the magnetic observatory to this site at its own expense were there any certainty that electric cars might not ultimately again interfere with the work.

PUBLICATIONS.

The usual regular publications, including the monthly bulletins and Part III of the annual report for 1903 embodying the observations made at all secondary stations during that year, have been issued and distributed. The only special publication issued is an exhaustive monograph on the so-called "Cantabria cyclone," which reached its maximum intensity at Manila on September 26, 1905. This monograph was published in connection with one of the regular monthly bulletins. The unusual demand for it necessitated the reprinting of both English and Spanish editions.

An arrangement has now been made by which the tables of statistics from the secondary stations will be materially condensed, and a corresponding saving will result in the cost of printing for the coming fiscal year.

CHANGES IN STATIONS.

The changes in the provincial stations of the bureau have been few and unimportant. The third-class station at Masinloc, in Zambales, and the second-class station at Bolinao, in the same province, have been suppressed, and a rain station has been transferred from Marilao to Malolos, Bulacan, and raised to a station of the third class. These changes are in accordance with a general plan for increasing the efficiency of the weather bureau and decreasing the cost of maintaining it by getting stations into immediate touch with the telegraph system wherever possible and by utilizing as observers, when practicable, persons already in the employ of the insular government.

On November 4, 1905, a committee consisting of Col. H. B. McCoy, insular deputy collector of customs, chairman; Herbert L. Dakyne, light-house engineer; Rev. G. M. Zwack, secretary of the weather bureau; Capt. Rush P. Wheat, chief of the telegraph division, Philippines constabulary, and Mr. G. L. Putnam, director of coast surveys, was appointed to investigate and make recommendations looking toward the improvement of the whole interisland signal service. Among the points to be considered were the feasibility of utilizing light-houses for meteorological observations, increasing the number of stations at which typhoon signals are displayed, and more effectively

and generally spreading storm warnings. The secretary of the weather bureau, who was a member of this committee, worked out a new plan for the distribution of meteorological stations which provides for 5 stations of the first class, 9 of the second class, 38 of the third class, and 5 rain stations, a total of 57 stations, of which 47 would be in telegraphic communication with Manila, as against 34 at present. The proposed increase in the number of stations would be accomplished without any increase in the salary list by dropping two stations of the first class. The number of provincial stations equipped with typhoon signals would be increased from 7 to 30.

No action has as yet been taken on this report, but it is hoped that it may be considered in the near future, and that the recommendations relative to change and distribution of the weather stations may be favorably acted upon.

While on leave in Europe, Father José Algué, S. J., director of the weather bureau, took charge of a party of astronomers which went to Palma de Mallorca to observe the total eclipse of the sun on August 30, 1905, and also attended the International Congress of Directors of Meteorological Services at Innsbruck, Austria.

Father Algué has recently been elected one of the twenty honorary members of the Royal Meteorological Society of London.

FINANCIAL STATEMENT.

The disbursements of the weather bureau during the fiscal year ending June 30, 1905, were as follows:

Salaries and wages	₱68,399.14
General expenses, twelve months	13,949.12
Telegrams, five months	5,373.56
Printing, seven months	4,437.78
Total	92,159.60

Further details of the work of the weather bureau will be found in the report of the director (Appendix G).

NO DEFICIENCIES INCURRED.

The undersigned is glad to be able to state that no bureau of the department of the interior made expenditures in excess of its appropriation. At the time the appropriation for the weather bureau was made the director misunderstood the cost of telegrams, and as a result the amount requested by him and authorized to pay for telegrams was entirely inadequate to meet the necessities of the service. This mistake was discovered almost immediately after the appropriation bill was printed, and the additional sum necessary to pay for the amount of telegraphic work which had been authorized was immediately made available by resolution of the Commission. The appropriation of this sum in the deficiency bill is not therefore in any proper sense a deficiency appropriation, but is rather the correction of an error in the regular appropriation bill.

CHANGES IN MINING AND LAND LAWS RECOMMENDED.

In every report of the Secretary of the Interior made since the act of Congress of July 1, 1902, was passed, attention has been called to the harmful operation of certain of the provisions of that act relative to mining claims and to the sale of public lands. In the last annual report this subject was dealt with in some detail, and specific recommendations were made. The secretary of the interior would be neglecting his evident duty if he did not reiterate the statements and recommendations made in his last report and urge once more upon the Commission the necessity of exhausting all proper means to secure Congressional action on these important matters. In view of the present agricultural and financial crisis in these islands all possible measures calculated to increase their commercial prosperity without interfering with that of the United States should certainly be adopted by Congress.

Very respectfully,

DEAN C. WORCESTER,
Secretary of the Interior.

To the PHILIPPINE COMMISSION,
Manila, P. I.

APPENDIX A.

REPORT OF THE DIRECTOR OF HEALTH.

DEPARTMENT OF THE INTERIOR,
BUREAU OF HEALTH,
Manila, P. I., August 16, 1906.

SIR: Pursuant to the instructions issued by the honorable, the secretary of the interior for the Philippine Islands, I have the honor to submit herewith the following report of the operations of the board of health for the Philippine Islands from July 1, 1905, to October 31, 1905, and of the bureau of health from November 1, 1905 to June 30, 1906, this being a complete report of the health work in the islands for the year ended June 30, 1906, and the seventh annual report of this division of the Philippine government.

The comparative freedom from disease which residents of the Philippine Islands, who are willing to follow the few simple rules recommended by the bureau of health, have enjoyed during the year, although constantly exposed to highly communicative diseases the mortality of which is exceedingly high, is another most convincing proof of the value of health organizations, when health legislation places them in position to carry out modern scientific sanitary methods. In other words, for an expenditure of 5 centavos (2½ cents United States currency) per capita per annum, based upon a population of 6,500,000, over 1,000,000 persons have been protected against smallpox, and, of over 1,600,000 living in the provinces and exposed to cholera, only 4,143 contracted the disease, which means that only dozens were seized, where hundreds were attacked before.

Quinine was distributed free to persons living in malarious districts, and good health was enjoyed by thousands, where sickness and death were ever present in the past. Many water courses, from which town water supplies are obtained, were protected from pollution, thus adding many more thousands to those enjoying good health, instead of being afflicted with water-borne diseases. Vigorous measures were enforced to enable the public to obtain good meat. The few cases of measles and diphtheria, which came to these shores, were carefully isolated to prevent the spread of the infection, and thus the Philippines were protected from at least two diseases which have not as yet gained a foothold. In order to prevent that dreadful scourge of modern civilization, typhoid fever, from establishing itself in the Philippine Islands, all cases of this disease were searched for and measures taken to disinfect discharges from such patients in order that there might be no spread; and in many, many other ways measures were taken which prevented persons from contracting disease, and thus the work of the bureau of health has added very much to the sum total of happiness which was enjoyed by the people of these islands, as well as contributing to the economic wealth of the country by increasing the producing power of the people.

Each succeeding year of experience in health work shows very clearly that the white man's chances of contracting disease in the Philippine Islands are less than they are in the United States. During the year the death rate among Americans was only 9.34 per thousand, and even if several per cent is added for those who left here sick and subsequently died in the United States the death rate will still not be higher than in the most salubrious communities in the United States.

To keep the cholera from becoming epidemic and to confine it to as small a territory as possible has required the best efforts of the officers and employees of the bureau of health during the year. In almost every instance where it was impossible to institute measures against its suppression the disease assumed threatening proportions, and it was only with the greatest difficulty in those instances that it was brought under control. While it is satisfactory to report that cholera was confined to narrower limits and less persons affected thereby

than has been the case previously in the Philippine Islands, yet it is very discouraging for a health officer to be compelled to devote the greater portion of his efforts to keeping a disease in check, which, even if successful, does nothing to improve the health conditions in the islands in a permanent way. In other words, if the energy which has been expended in combating cholera could have been devoted during the year to making permanent sanitary improvements which would make such diseases as cholera impossible, a large step in advance would have been taken, instead of our energy being dissipated and nothing permanent being accomplished. Yet, in spite of the fact that so much time was required in combating cholera, more work was accomplished than in any year since the bureau of health has been established, more persons were vaccinated, more sick treated, more permanent sanitary improvements made, more medicine was distributed, more nuisances abated, more free dispensaries operated, and less plague, less smallpox, and less beriberi in public institutions occurred than has heretofore been the case in any one year, and what is also well worth mentioning is the fact that these results were obtained with smaller appropriations than have been expended yearly during the preceding four years.

HISTORICAL.

The first board of health in the Philippine Islands, after American occupation, was assembled in compliance with General Orders, No. 16, dated Headquarters of the Department of the Pacific, Eighth Army Corps, Manila, P. I., September 10, 1898. This order directed Dr. Frank S. Bourns, major and chief surgeon, U. S. Volunteers, and Dr. C. E. McQuesten, acting assistant surgeon, U. S. Army, to report to the provost-marshal-general for duty in connection with the organization of the board of health for the city of Manila.

The board was formally organized by General Orders, No. 15, dated Headquarters, Provost-Marshall-General, Manila, P. I., September 29, 1898, and was composed of Dr. Frank S. Bourns, president; Dr. C. L. Mullins, assistant surgeon, U. S. Volunteers, and Dr. C. E. McQuesten, acting assistant surgeon, U. S. Army, as active members, and Dr. T. H. Pardo de Tavera and Dr. Ariston Bautista Lim, both of Manila, as honorary members.

The city was divided into ten districts and a municipal physician appointed for each. Eight municipal midwives were also appointed, and a physician for San Lazaro Hospital, all by the same order.

On October 8, 1898, the first rules and regulations of the board of health were published.

One of the most important problems that the newly organized board was called upon to deal with was that of an epidemic of smallpox. The old Spanish vaccine farm was reestablished, and a corps of city vaccinators put to work, and by the end of the fiscal year 80,000 people in the city of Manila had been vaccinated, 82 per cent of the vaccinations being successful. In the meantime a smallpox hospital, a leper hospital, and a hospital for the treatment of venereal diseases had been established, and a veterinary corps organized.

This provisional board of health continued in existence until August 26, 1899, when the first commissioner of public health, Dr. Guy L. Edie, was appointed. The reorganized board added a bacteriological department to the municipal laboratory which had been conducted by the former board of health, established a plague hospital, and instituted the registration by the board of health of births, marriages, and deaths, which heretofore had been in charge of the parochial priests. A municipal dispensary was organized, and the work of protecting the city against smallpox, so successfully inaugurated by Major Bourns, was continued.

After the advent of the civil commission the passage of act numbered 62 gave the provost-marshal-general the right to promulgate ordinances for the city of Manila, and matters which had heretofore been governed by rules and regulations were embodied in ordinances and enforced by military authority. The first health ordinance was promulgated on April 6, 1901, and is still in force with the exception of one or two provisions which have been repealed by other ordinances. This ordinance, which included nearly every phase of municipal sanitation, has been the foundation of all subsequent ordinances and of the proposed sanitary code. It provided, among other things, that every physician called to visit or examine any case of infectious or contagious disease, should immediately cause such patient to be promptly isolated, after which notice should be given to the health authorities by such physician. The term "infectious and contagious disease" as defined, included cholera, smallpox,

chicken-pox, plague, diphtheria, including membranous croup, ship or typhus fever, typhoid, spotted, relapsing, yellow, and scarlet fevers, measles, glanders, leprosy, anthrax, and any other disease of an infectious, contagious, or pestilential nature, or any disease declared by the board of health of Manila to be dangerous to the public health.

Another important section was the compulsory vaccination clause which made it the duty of every person in Manila to be successfully vaccinated at intervals of one year, and provided that every person who had been exposed to the infection of smallpox, including varioloid, should be successfully vaccinated, or revaccinated a sufficient number of times at intervals of two weeks to render it evident that successful vaccination was impossible.

The board of health for the city of Manila continued in existence until its employees were formally transferred by act No. 187, to the board of health for the Philippine Islands which had been organized under act No. 157. The new board consisted of a commissioner of public health, a chief health inspector, a sanitary engineer, a secretary, and the superintendent of the government laboratories as active members, and the chief surgeon of the United States Army in the Philippines, the chief surgeon of the United States Public Health and Marine-Hospital Service in the Philippine Islands, and the president and the vice-president of the Association of Physicians and Pharmacists of the Philippine Islands, as honorary members.

The law provided that the board of health for the Philippine Islands should also act as the board of health for the city of Manila.

The next health legislation was comprised in act No. 307, entitled "An act establishing the provincial boards of health and fixing their powers and duties." Following this came act No. 308, establishing municipal boards of health, thus making the chain complete.

The compulsory vaccination, which had been practiced in Manila since the organization of the health service, was extended throughout the provinces by act No. 309, which provided that every person living in the Philippine Islands, who could not furnish satisfactory evidence, by certificate of recent date from either a president of a municipal board of health, a public vaccinator, or a duly qualified physician, or such other person as the board of health might designate, that he is immune, should be vaccinated as often as the health authorities deemed necessary.

Subject to the supervision and control of the board of health for the Philippine Islands, the provincial boards of health had general supervision over the health and sanitary conditions of their respective provinces, including the health of domestic animals; exercised general control over the municipal boards of health within their jurisdiction; caused to be prosecuted all violations of sanitary laws, and enforced the regulations of the board of health for the Philippine Islands, and, subject to the supervision and control of the provincial boards of health, municipal boards of health had general supervision of the health and sanitary conditions of their municipalities, with power to enforce the regulations of the board of health for the Philippine Islands and of the provincial boards of health.

The next important act in health legislation is known as act No. 310, regulating the practice of medicine and surgery in the Philippine Islands. The act was passed just in time to keep the islands from being overrun by quacks and impostors from all parts of the world.

With this legislation, supplemented by special acts, such as the act regulating the practice of dentistry, and the act regulating the practice of pharmacy, as a working basis, the board of health extended its operations to every municipality in the archipelago, and conducted its work until changed into the bureau of health by act No. 1407, otherwise known as the reorganization act.

Under act No. 1407, unless otherwise provided by law, the director of health is the legal successor of the board of health for the Philippine Islands, which was abolished by said act, and of the commissioner of public health.

This bureau has an assistant director of health, and in every other respect is on a bureau footing—the only bureau of health under the American Government.

The director of health was given authority, subject to the approval of the secretary of the interior, to revoke or modify any order, regulation, by-law, or ordinance of a local board of health, or of any municipality, except in the city of Manila, concerning any matter which in his judgment affects the public health. The director of health has not yet had occasion to exercise this authority, but the very fact that the law has provided a remedy against inimical ordinances and regulations has been sufficient to bring about the results desired.

The reorganization act abolished the civil hospital and the civil sanitarium, Benguet, as separate bureaus, and merged them into the bureau of health as divisions thereof, and provided that the director of health shall perform or cause to be performed, and shall render or cause to be rendered the services required of the respective attending physicians and surgeons of the Philippine civil hospital and the civil sanitarium, by laws and executive orders in force at the time of the passage of the aforesaid act.

The bureau of health was also charged with the duty of caring for the health of the prisoners of Bilibid prison, and the insular penitentiary was given control and supervision of the sanitation of all insular prisons and penal settlements, and placed in supervisory control over sanitation of all provincial and municipal prisons.

The only elimination effected by the reorganization was the transfer of the veterinary division of the former board of health to the bureau of agriculture as the division of animal industry, the right and duty of the director of health to safeguard the public health against dangerous diseases which may be communicated to man by animals or by means of animal products being reserved by a special provision of law.

After the general reorganization, by which the board of health for the Philippine Islands became the bureau of health, and the powers and duties of the former board and the commissioner, together with those incident to the merging of other bureaus, it became necessary to readjust the local machinery by an internal reorganization which involved the abolishing of certain divisions, the creation of others, and a general rearrangement of duties to meet new conditions.

The bureau of health, as now constituted, consists of eleven divisions, designated as follows: Provincial health division, inspection division, clerical division, property division, statistical division, sanitary engineering division, San Lazaro hospital division, civil hospital division, prison sanitation division, Benguet sanitarium division, and Culion leper colony division. Matters pertaining to the respective divisions are administered through the chiefs thereof, after passing over the desk of the director, for his action.

The inspection division, which includes the duties of the chief health inspector under the former law, is now under the control of the assistant director of health.

All financial matters are handled personally by the director, who by this method is enabled to keep the expenses within reasonable limits and to acquire an intimate knowledge of the details of the bureau.

The experience of the past year has amply justified the change from the board to the bureau system. The saving in time alone, to say nothing of money and annoyance, has in itself fully warranted the reorganization so far as the bureau of health is concerned.

Health legislation for the Philippine Islands, a brief of which has been given, shows that we are passing rapidly from the formulative or evolutionary state to a definite, permanent basis.

The Philippine Commission has recently passed act No. 1487 abolishing provincial boards of health, substituting therefor district health officers, and defining their powers and duties and repealing act No. 307 entitled, "An act providing for the establishing of provincial boards of health, and fixing their powers and duties." This act, after abolishing the provincial boards of health, provides among other things, that each province may have a district health officer, appointed by the governor-general with the advice and consent of the Philippine Commission. Any regularly appointed person holding the office of president of a provincial board of health at the time of the passage of act No. 1487 is eligible for appointment without examination to the position of district health officer during the period of two years from the date on which said act became effective.

Salaries of district health officers and of all other officers and employees assigned to health districts by the director of health shall be paid monthly from funds set aside for the support of the bureau of health. Under the old law they were paid by the respective provinces direct, and now each province of a health district is required to deposit in the insular treasury, to the credit of the bureau of health, on or before the 31st day of January and July of each year, its proportion of the salary of the district health officer or officers and of the salaries of all other employees assigned to the health district by the director of health, such proportion to be calculated by the insular auditor, who shall base the same upon the populations of the respective provinces of the districts as determined by the latest census.

District engineers shall give information to district health officers as to the existence of any insanitary conditions and of any failure to comply with legal sanitary orders and regulations.

The district health officer, within his district, is to exercise general supervision and control over the health and sanitary work and over the municipal boards of health within his district; is to have the power to institute all proceedings necessary to abate nuisances, and may cause to be prosecuted all violations applicable to the district, and has the power to remove the cause of any special disease or mortality and to make and enforce, subject to the approval of the director of health and of the secretary of the interior, such internal quarantine regulations as he may deem necessary in any part of his district.

It is to be the duty of the district health officer of each district to prepare and recommend to the director of health suitable regulations for maintaining in a sanitary condition all prisons, jails, theaters, schools, colleges, and other public or private institutions within his district, and, when practicable, to attend all persons entitled by law to receive free medical aid and attendance, and upon the application of the local authorities, when practicable, to attend free of charge persons confined in provincial or municipal prisons and inmates of other government institutions. District health officers are to exercise the powers conferred upon them under the direct supervision and control of the director of health, and to make such reports and to compile such statistics as he may require.

One special feature of the law is that whenever it shall be shown to the satisfaction of the governor-general that any health district or part thereof is threatened with or suffering from an epidemic of infectious, contagious, or communicable disease of a dangerous character, he may, in his discretion, issue an executive order declaring that the said district or any part thereof is threatened with or suffering from an epidemic, and invest the director of health with emergency power to prescribe, subject to the approval of the secretary of the interior, such emergency health regulations as may be deemed necessary to prevent or suppress the occurrence or spread of such infectious, contagious, or communicable disease, and such regulations shall have the same force and effect and shall be enforced in the same manner as if enacted by legislative authority throughout the district or districts or parts thereof as may be specified in the said regulations.

When it is shown to the satisfaction of the governor-general that the danger of an epidemic has passed, he shall so declare by Executive order, and upon publication of such Executive order, the emergency health regulations shall become null and void, unless in such Executive order it is specifically declared that one or more of the emergency regulations shall remain in effect for a further period to be prescribed.

District health officers are to have authority to require that owners, agents, or occupants of any buildings, premises, places, or any part thereof, shall place and maintain them in a sanitary condition so far as the same relates to cleanliness. It is also to be the duty of district health officers, in necessary cases, to request the presidents of municipalities to enforce the municipal ordinances relating to sanitation, and in case a president neglects or refuses to perform his duty in that behalf, it is hereby made the duty of the district health officer to cause to be instituted proceedings against such president in the court of the first instance. In case the court finds that the president is guilty of neglect or refusing to enforce such ordinances, he shall be fined not exceeding ₱200, or imprisonment not exceeding six months, or both, in the discretion of the court, and shall be removed from office. The penalty for not complying with the requirements of the law is sufficiently strong to vouchsafe respect.

On the 30th day of June, 1906, provincial boards of health ceased to exist; the chain was temporarily broken. If it were possible to maintain our effective system of municipal boards of health, managed by competent physicians, the provincial or district organization would be of less importance; but, under the present circumstances, reliance must be had almost altogether on them, hence the necessity for concentrating and enlarging the power of the field representatives of the bureau of health, in accordance with the general plan of concentration and in the interests of economy measured both in time and money.

It is hoped that the new law, only a few features of which are referred to herein, will prove as satisfactory in practice as it is in theory. Organization and system mean everything in health work, in the Tropics as elsewhere.

CEMETERY LEGISLATION.

The Commission passed, on February 21, 1906, an exhaustive act regulating the establishment and maintenance of burial grounds and cemeteries and governing public funerals and the disposal of the dead in the provinces. The legislation was enacted to settle disputes with regard to cemeteries. Many of these arose on account of the differences between the Roman Catholic Church and the independent Filipino Church, the latter headed by Father Aglipay, being composed mostly of persons who formerly were members of the Roman Church. Practically every aspect of the disputed question has been covered by this cemetery act, which makes the settlement of such questions purely legal, and thus greatly simplifies a heretofore vexatious and delicate duty.

There is now pending before the municipal board of the city of Manila a proposed ordinance entitled "An ordinance relating to sanitation and providing a sanitary code for the city of Manila." This ordinance was originally prepared by the board of health for the Philippine Islands and forwarded to the secretary of the interior for transmittal to the municipal board in the manner provided in the act No. 1150, under the authority of which it was written. The secretary of the interior found that there were many provisions in the proposed code, as submitted, to which he could not give his assent. Furthermore, he requested that the number of sections be reduced as much as possible, in order to prevent the code from becoming too unwieldy. On this account it was returned to the present director of health, who rewrote the original code and returned it to the secretary of the interior. It then received his provisional approval and was forwarded to the municipal board for enactment. Necessary delays and postponements have prevented the same from becoming a law, greatly to the detriment of the administration of health work in the city. The imminent danger of contaminating the water supply by bathing in the Mariquina River and the crossing of animals during the presence of cholera, rendered it imperative that the chapter on water be passed, and that provision be made for its enforcement without cumbersome delays; and to this end the Commission passed a special act conferring on officers of the United States Army in command of troops detailed, at the request of the governor-general, to aid the director of health of the Philippine Islands in the enforcement of sanitary regulations, municipal health ordinances, and health laws, while in the performance of such duties, the status of peace officers with the right to bring the violators of such regulations, ordinances, and laws into court for trial; and also vesting soldiers of the United States Army serving under command of such officers with the authority to apprehend persons detected in such violation, and immediately deliver them to an army officer having the power of a justice of the peace. While this report does not cover the period beyond June 30, 1906, it is perhaps proper to add here that the experience gained during the month of July has amply demonstrated that the foregoing legislation is very effective. In fact, it has been possible to keep the Mariquina Valley in a far better sanitary condition than has heretofore been the case at any time since the islands came under civil administration. These special precautions for the safeguarding the water supply will be necessary until the new reservoir and water system, now in process of installation, are completed.

HEALTH AND CLIMATIC CONDITIONS.

Having briefly outlined some of the main features of sanitary legislation under which the health authorities have operated since American occupation, it may be appropriate to say for the information of those who are contemplating a residence in the islands, and to those in the homeland who are worrying about their friends and relatives, that with respect to the climatological factors, temperature, and atmospheric movements, the climate of the Philippine Islands is not extreme, and occupies at least an intermediate place in the classification of tropical climates. It is distinctly insular in character, the greater portion of the land area being not far distant from the sea. Besides this, there are other modifying influences which obtain in portions of the archipelago, such as general ocean and local interisland currents, prevailing winds, elevations, state of cultivation and drainage of the soil, and the presence of forests and other plant life.

Excluding localities in the tropics characterized by excessive heat, high relative humidity, and unhealthful soil conditions, acclimation or physiologic adap-

tation of the white man to the tropical environment is possible, and is usually completed after the second year. Many people in the Philippine Islands escape the inconvenience and discomforts of the period of acclimation. With sanitary surroundings, and by observing the rules of personal and domestic hygiene, Americans live in safety in the Philippines with as little danger of disease or death as they might expect in the United States under similar sanitary conditions. In no country in the world has the Government done more for the protection of its employees. In addition to the bureau of health, with its ample hospitals and sanitariums, there is a bureau of science, where investigations are carried on by specialists in the various branches of science, especial attention being given to the pathology, biology, serum therapy, including practical inoculations and vaccinations.

SANITATION IN MANILA.

During the year, the city of Manila has been redistricted so as to make the sanitary districts correspond with the police districts, thus not only enabling the two services to cooperate to a greater advantage than under the old system, but a considerable saving was effected by eliminating one sanitary station. This arrangement has also been the means of saving the city nearly seven thousand pesos for the salaries of former police surgeons, to say nothing of the expense incidental to their transportation. There are forty native police on special duty as sanitary inspectors, who, while carried on the pay rolls of the city police department, are under the direction of the bureau of health in all matters except discipline and leaves of absence. The personnel of a health station consists of a medical inspector in charge, an American sanitary inspector, usually a native assistant sanitary inspector, its quota of police sanitary inspectors, one or more municipal physicians, and one or more municipal midwives. Each station is charged with the duty of looking after the health and sanitary conditions of the district in which it is located. This involves the sanitary inspection of buildings, schools, bottling works, tiendas, hotels, restaurants, yards, alleys, latrines, vaults, stables, sewers, and similar places and conveniences, and the preparation of orders for their repair, or in the case of sewers, the notification of the proper authorities.

The stations also collect vital statistics, cause to be examined samples of water and food, investigate the sources and causes of disease, abate nuisances dangerous to the public health, exercise sanitary supervision over the markets, supervise local quarantine or detention, attend to the pauper sick, and look after dangerous communicable diseases. Medical inspectors act as coroners, physicians, and visit and examine all paupers who apply for hospitalization, in order that they may be properly assigned. The stations also cooperate with the sanitary engineering division in those matters which require the advice and assistance of a sanitary engineer. Complete reports are submitted at stated times, and special reports as often as the occasions justify. In case of a dangerous communicable disease, immediate report by telephone is sent in, and the regular station report at the first opportunity. This arrangement enables the central office to keep in close contact with all that is going on of a sanitary nature in the city.

One of the main purposes sought to be attained in passing the district health officers act is a systematic organization, so far as practicable, for the provinces, on the general principles of the Manila system—that is, a complete adjustable organization that can be relied upon to meet any emergency that may arise.

VITAL STATISTICS, CITY OF MANILA.

Births.—The bureau of health has tried nearly every available means of securing accurate statistics with reference to births. It has had prepared a special blank printed in English and Spanish, and members of families, or the person giving the information, are permitted to sign said blank if there was no physician or midwife present. The advent of a baby in a Filipino household is too common an occurrence to remind the parents that its coming should receive official cognizance; the mother is up and at her duties the next day after the event, and often times, the date including the day, month and year is forgotten. Some progress has been made, as may be observed from the fact

that for the fiscal year ended August 31, 1904, the percentage was 35.36 per thousand, and for the fiscal year covered by this report it was 39.46 per thousand. The proposed sanitary code provides that for the purpose of securing statistical information, baptismal records or any other records relating to vital statistics kept by the churches or other institutions in the city of Manila, shall be accessible to any duly authorized officer or representative of the bureau of health.

It will undoubtedly require many years to educate the people as to the importance of reporting births.

Deaths.—During the period covered by this report there were 9,016 deaths among the permanent population in Manila, and 470 deaths among transients. The death rate among the permanent population of Manila was 40.99 per mille. If the number of deaths from cholera, which disease did not occur during the period covered by the report for last year, is deducted from the total number, the death rate will drop to 38.51 per mille, which is actually 2.48 per mille lower than it was for the year preceding. This is another evidence that the death rate of the city is being gradually brought down.

INFANT MORTALITY.

About three years ago the bureau of health began a campaign of education in matters pertaining to the care of infants. A special bulletin was prepared by a committee of native physicians and distributed among the people. In this bulletin special emphasis was placed on the value of proper feeding and the danger of allowing children to eat solid food before the eruption of the temporary teeth. It was shown that the mother's milk is the proper food for a young child, and that the next best substitute is cows' milk. The best evidence that the health authorities have that these bulletins were widely read, even if not to advantage, is the fact that the consumption of milk in the city has increased probably 500 per cent nearly all of the output being used as food for infants. As important as the factor is, it has had no marked effect in saving the lives of children and the reason therefor must be apparent to all who know anything of local conditions. The trouble lies either in the improper care of vessels and receptacles in which the milk is kept, the practice of adding river or estero water, and the failure to take the necessary precaution to keep the milk fresh. There is also the contamination at the time of milking to be reckoned with. Probably 95 per cent of the milk used is carabao milk. The carabao is by nature a dirty animal and doubtlessly contributes a full share to the sum of impurities that vitiate the milk by the time that it reaches its destination, the infant's stomach.

The proposed sanitary code, which is still delayed, provides that all milk dealers shall register at the bureau of health, and that all vessels or receptacles used by them as containers for milk shall be made of smooth impervious material, which is capable of being thoroughly sterilized by heat or other improved means, and that such container shall be provided with a suitable cover for protection against dust or other impurities, and shall be sterilized each time before use. The code also provides that all milk sold or offered for sale, shall be at all times subject to examination and analysis by the bureau of health, and that diseased milch animals may be summarily condemned and destroyed.

The practice of adding water to milk is so firmly established that it has been found necessary to make provision in the pending code that it shall be unlawful to bring into the city, or sell, or offer for sale any milk that is not fresh or wholesome, or that has been watered, adulterated, reduced, or changed in any way by the addition of water or other substance. Adulterated milk is defined as: (a) Milk containing less than 12 per cent of milk solids, including fats; (b) milk containing more than 88 per cent of water or fluids; (c) milk containing less than 3 per cent of fats; (d) milk drawn from animals within fifteen days before or after parturition; (e) milk drawn from animals fed on any substance in a state of fermentation or putrefaction, or any unwholesome food; (f) milk drawn from cows in a diseased or unhealthy condition, or from cows kept in a crowded or unsuitable place; (g) milk from which any part of the cream has been removed, unless the fact is made known to the purchaser at the time of sale; (h) milk to which has been added water, or any foreign substance whatever.

It will no doubt be a difficult matter to enforce these regulations, even when enacted as ordinances, but improvement is bound to follow. Success will not come until the people themselves learn to appreciate the fact that most diseases are introduced into the system from without, and that the infecting principle is a germ against which the only protection is absolute cleanliness. This idea of disease appears to the minds of the masses of the people as too hypothetical to be worthy of belief. The native physician, in the course of time, may finally educate the people along these lines, but not until the needless sacrifice of thousands.

PUBLIC CHARITIES.

The bureau of health has special contracts with the Hospició de San José for the care of a limited number of insane patients, old people, and orphans; and with the Santa Isabel Convent, and the Convent of the Sisters of the Order of San Vicente de Paul, for the care of homeless and friendless girls. The city has a special contract with the St. Paul's Hospital, and with the San Juan de Dios Hospital, for 50 beds each for the hospitalization of the poor.

Station clinics.—Daily clinics are held at all of the health stations, and at the central office. A doctor is in constant attendance to wait on such cases as fail to attend the respective clinics during the regular hours.

Central pharmacy.—At the beginning of the year three separate pharmacies, for the filling of prescriptions written for the indigent poor, were maintained in different sections of the city. These were combined into one and removed to the central office of the bureau of health. Arrangements were then made so that perscriptions, which are more or less complicated in character, could be filled either at the Central Pharmacy, the Civil Hospital, San Lazaro Hospital, and at the Episcopal Dispensary in Tondo. At the places at which the pharmacies were formerly located dispensaries for the treatment of the sick were continued, and a small supply of medicines furnished to each of them, so that first-aid remedies and simple medicines can be obtained at all health stations in the city of Manila.

By this means it has been possible to reduce the expense of furnishing medicines to the poor and at the same time increase the number of places at which treatment can be obtained and prescriptions filled.

Other free dispensaries.—In addition to the free-dispensary service of the bureau of health there is the outclinic, medical, and dental of the St. Paul's Hospital, the St. Luke's dispensary of the Episcopal Church, the Annie Norton dispensary (private), several free clinics conducted by native physicians, and there soon will be in operation a free maternity hospital to be conducted under the auspices of the Methodist Church. These institutions are a great blessing to the poor, who, in steadily increasing numbers, are availing themselves of their benefits.

Municipal physicians.—In each district there are one or more native physicians in the employ of this bureau whose duty it is to attend to the poor. There is no class of men in Manila who do more good than the municipal physicians. The service of a Chinese physician, a regular graduate, and a member of the Manila Medical Society, and the Philippine Islands Medical Association, has been secured to attend to the pauper sick among the Chinese.

Municipal midwives.—In each district there is a sufficient number of municipal midwives employed to attend to all confinements among the poor. The employees are under the supervision of the district medical inspectors and under the direct charge of the municipal physicians, with whom they are required to cooperate and to whom they must go for assistance.

THE OUTBREAK OF CHOLERA IN THE PHILIPPINES OF 1905-6 AND THE METHODS USED IN COMBATING IT.

According to the official records on file at the bureau of health for the Philippine Islands the last case of cholera of the pandemic which commenced March 20, 1902, was reported to have occurred March 8, 1904. During that period 166,252 cases, with 109,461 deaths, were reported. Reliable observers are of the opinion that at least one additional case occurred for each one that found its way into the official records.

From March 8, 1904, until August 23, 1905, no cases are known to have occurred. From time to time during this latter period suspicious cases, which

clinically resembled Asiatic cholera, came to the attention of the insular board of health, but the diagnosis could not be confirmed bacteriologically. For the two weeks immediately preceding August 23 the number of suspicious cases increased. In Manila one occurred in San Pedro Macati, a suburb of Manila; one in a bakery in Paco; one in the San Miguel district; another case was that of a soldier in Cuartel de España, and there were several in the province of Rizal. The cases in Manila were all carefully autopsied, and the intestinal contents bacteriologically examined by such competent observers as Dr. R. P. Strong, of the government laboratory, and his assistants; and the case of the soldier was carefully investigated by the military medical authorities and specimens examined at the army laboratory which is maintained in connection with the first reserve hospital in Manila. From both of these independent sources the results were reported as negative. On August 23 a case developed in Bilibid prison which was a typical clinical picture of cholera. After a few hours the victim succumbed. The post-mortem examination showed the ileum to be deeply injected and filled with rice water like material, and the bacteriological examination made by Dr. R. P. Strong revealed the spirillum of Koch. Thus occurred the first officially recognized case of cholera of the present outbreak.

A case in an institution which is practically cut off from the remainder of the world; where all foodstuffs are permitted to enter only after the most rigid inspection; where all food served that could likely convey cholera is cooked at all times, and, on account of dysentery, it is said that all drinking water was sterilized; it would seem that the routine precautions thus taken should also have afforded protection against cholera. The commencement of an outbreak in this insidious manner was most puzzling to the sanitary authorities, and the prospects of combating a disease whose origin was so obscure were not encouraging.

On the following day six cases, suspiciously like cholera, were reported by Major Wales, from Fort William McKinley, which is located about seven miles up the Pasig River from Manila. For the week preceding August 23, about eight cases, with profuse diarrhea and vomiting, followed by collapse, had occurred at the fort. The symptoms were the same as those usually found in vino poisoning, which is so common among the United States soldiers in the islands, and in the absence of any cholera being reported anywhere in the Philippines, there was no particular reason for investigating the cases further. In view of the fact, however, that the diagnosis of some of the later cases that occurred at the fort was bacteriologically confirmed, the earlier diagnosis of vino poisoning may not have been correct. The military medical men at once commenced active measures, and the comparatively few days during which cholera persisted at the fort is another excellent example of how readily the disease can be eradicated when sanitary principles are intelligently applied.

On August 25, an American woman residing at the Grand Hotel, in the Walled City, was attacked and died in a few hours. On the same day an American man residing on San Sebastian street, in a section of the city nearly two miles from the previous case, was seized, and died several hours afterward. No connection could be traced between the two cases, nor could any history be obtained that the same articles of food which would be likely to convey the infection had been eaten by these two victims.

Cases in Manila then occurred as follows:

Date.	Number of cases.	Date.	Number of cases.
1905.		1905.	
August 23	2	September 1	17
August 24	1	September 2	12
August 25	3	September 3	27
August 26	8	September 4	18
August 27	10	September 5	12
August 28	6	September 6	10
August 29	9	September 7	8
August 30	5	September 8	7
August 31	7	September 9	4
		September 10	3

and from this period the cases averaged about one per day until the end of the year, the total cases from August 23, to December 31, 1905, inclusive, being 250.

The characteristic tendency of the outbreak continued during the early weeks of the scourge, viz, no connection could be traced between the cases. No two cases occurred in any one house, nor did two cases occur in any one group of houses. To bring this point out more clearly, the chronological order in which the cases occurred is given on the map shown in Plate No. 1,^a from which it may be seen that the next case almost invariably occurred in a section of the city far distant from the previous case, and furthermore, it will be noted that the next case did not occur in the same section until the likely incubation period had expired.

At the commencement of the epidemic of 1902 cases were reported in Manila as follows:

Date.	Number of cases.	Date.	Number of cases.
1902.		1902.	
March 20.....	4	April 1.....	17
March 21.....	6	April 2.....	4
March 22.....	4	April 3.....	13
March 23.....	8	April 4.....	13
March 24.....	14	April 5.....	9
March 25.....	15	April 6.....	11
March 26.....	12	April 7.....	9
March 27.....	11		
March 28.....	6		
March 29.....	5		
March 30.....	11		
March 31.....	6		

By comparing this table with the previous one it will be seen that at the end of the second week there had actually been more cases during the outbreak of 1905 than during that of 1902.

In the meantime a telegram received August 26 from Jalajala, province of Rizal, through the Army Medical Department, contained the following information:

"Cases of a disease resembling cholera have developed in Jalajala, the first case being registered on the 21st; from that date to the 25th, 16 cases and 12 deaths have been registered, the illness lasting from twelve to twenty-four hours."

On August 26 another telegram received from the president of the provincial board of health of Rizal, at Pasig, reported one suspicious case, followed by death, in that town. A representative of the insular board of health and another from the bureau of government laboratories proceeded at once by special launch to Pasig and Jalajala, for the purpose of making an investigation as to the cause of the outbreak in these places. The result of this investigation did not shed any light upon the origin of the infection. Inquiry made by the inspectors only resulted in showing that at least one week prior to August 23 more deaths had occurred in Jalajala than usual, and that the victims had profuse diarrhea and died in a few hours after the symptoms manifested themselves.

An investigation made by Dr. L. T. Hess, captain and assistant surgeon, U. S. Army, of the records on file at Muntinlupa and Biñan, situated in Rizal and Laguna provinces, respectively, and on the opposite shore of Lake Laguna from Jalajala, showed that death certificates had been filed during the week preceding August 23 for a number of cases in which the cause of death was given as "suspicious diarrhea."

^a Plate No. 1 is on file in the War Department, where it may be consulted.

The following table will show the order in which other towns in the provinces became infected, the duration of the disease, and the number of cases and deaths:

Case No.	Town.	Province.	Date of first case.	Date of last case.	Number of cases.	Number of deaths.
1	Jalajala.....	Rizal.....	Aug. 20, 1905	Sept. 20, 1905	28	18
2	Guadalupe.....	do.....	Aug. 24, 1905	Aug. 24, 1905	1	1
3	Taguig.....	do.....	Aug. 25, 1905	Oct. 11, 1905	68	51
4	Pasig.....	do.....	Aug. 27, 1905	Oct. 31, 1905	59	47
5	Santolan.....	do.....	Aug. 28, 1905	Aug. 28, 1905	1	1
6	San Pedro de Macati.....	do.....	do.....	Sept. 22, 1905	4	4
7	Taytay.....	do.....	Aug. 29, 1905	Oct. 30, 1905	132	115
8	Guagua.....	Pampanga.....	Sept. 1, 1905	Feb. 5, 1906	87	76
9	Indang.....	do.....	do.....	Feb. 16, 1906	25	21
10	San Mateo.....	Rizal.....	Sept. 2, 1905	Oct. 13, 1905	16	12
11	Malabon.....	do.....	do.....	Feb. 16, 1906	80	73
12	Bulacan.....	Bulacan.....	Sept. 4, 1905	Mar. 2, 1906	31	22
13	Sangley Point.....	Cavite.....	Sept. 5, 1905	Sept. 5, 1905	1	1
14	Pasay.....	Rizal.....	do.....	Sept. 19, 1905	4	3
15	San Felipe Neri.....	do.....	do.....	Sept. 5, 1905	1	1
16	Pila.....	Laguna.....	Sept. 7, 1905	Jan. 12, 1906	9	8
17	Cavite.....	Cavite.....	do.....	Mar. 13, 1906	41	39
18	Parañaque.....	Rizal.....	Sept. 8, 1905	Apr. 23, 1905	5	3
19	Santa Rosa.....	Laguna.....	Sept. 11, 1905	Nov. 24, 1905	23	13
20	Mariquina.....	Rizal.....	Sept. 13, 1905	Oct. 26, 1905	9	8
21	Binangonan.....	do.....	Sept. 16, 1905	Nov. 19, 1905	60	29
22	Morong.....	do.....	do.....	Nov. 12, 1905	186	116
23	Antipolo.....	do.....	Sept. 17, 1905	Oct. 26, 1905	56	35
24	Meycauayan.....	Bulacan.....	Sept. 23, 1905	Sept. 23, 1905	1	1
25	Los Baños.....	Laguna.....	Oct. 2, 1905	Oct. 5, 1905	19	14
26	Imus.....	Cavite.....	Oct. 3, 1905	Apr. 4, 1906	195	148
27	San Francisco Malabon.....	do.....	Oct. 5, 1905	Nov. 28, 1905	12	11
28	Carmona.....	do.....	Oct. 6, 1905	Oct. 6, 1905	1	1
29	Caloocan.....	Rizal.....	Oct. 13, 1905	Oct. 16, 1905	4	2
30	Lucban.....	Tayabas.....	Oct. 12, 1905	Oct. 23, 1905	4	4
31	San Pablo.....	Laguna.....	Oct. 18, 1905	Oct. 18, 1905	1	1
32	Biñan.....	do.....	Oct. 16, 1905	Jan. 21, 1906	112	93
33	Pagsanjan.....	do.....	Oct. 20, 1905	Jan. 28, 1906	11	10
34	Paete.....	do.....	Oct. 21, 1905	Mar. 7, 1906	39	24
35	Naic.....	Cavite.....	do.....	Feb. 25, 1906	243	174
36	Bay.....	Laguna.....	Oct. 22, 1905	Oct. 22, 1905	1	1
37	Santa Cruz.....	do.....	Oct. 23, 1905	Jan. 28, 1906	48	41
38	Majayjay.....	do.....	Oct. 24, 1905	Jan. 14, 1906	17	12
39	Cabuyao.....	do.....	Oct. 28, 1905	Oct. 28, 1905	2	2
40	Calamba.....	do.....	Oct. 31, 1905	Jan. 21, 1906	65	44
41	Hagonoy.....	Bulacan.....	Nov. 1, 1905	Mar. 7, 1906	197	139
42	Novleta.....	Cavite.....	do.....	Feb. 6, 1906	135	80
43	Macabebe.....	Pampanga.....	Nov. 6, 1905	Apr. 22, 1906	81	68
44	Magdalena.....	Laguna.....	do.....	Jan. 14, 1906	7	6
45	Lilio.....	do.....	Nov. 8, 1905	Jan. 4, 1906	22	18
46	Nagcarlang.....	do.....	Nov. 9, 1905	Jan. 14, 1906	2	1
47	Tanauan.....	Batangas.....	Nov. 20, 1905	Dec. 11, 1905	10	6

In order to show the progress of the disease more clearly, the section of the Philippines in which cholera occurred is shown in Plate 2.^a Upon this map numbers have been placed which show the appearance of the disease, in chronological order, in the various towns affected.

The cases and deaths in the city of Manila, from August 23 to December 31, were distributed, by age, as follows:

Age.	Cases.	Deaths.	Mortality.
Under 30 days.....	0	0	-----
1 to 2 years.....	3	3	100.0
2 to 5 years.....	21	20	95.2
5 to 10 years.....	14	14	100.0
10 to 15 years.....	14	11	78.6
15 to 20 years.....	23	17	73.9
20 to 25 years.....	33	28	84.8
25 to 30 years.....	34	28	82.3
30 to 35 years.....	41	37	90.2
35 to 40 years.....	24	20	83.3
40 to 45 years.....	18	17	94.4
45 to 50 years.....	8	8	100.0
50 to 55 years.....	11	11	100.0
55 to 60 years.....	1	1	100.0
60 to 65 years.....	5	5	100.0
65 to 70 years.....	0	0	-----
70 to 75 years.....	1	1	100.0
75 to 80 years.....	1	1	100.0
80 to 85 years.....	1	1	100.0

^a Plate No. 2 is on file in the War Department, where it can be consulted.

The number of cases of cholera that occurred by race, between August 23, 1905, and December 31, 1905, and the date of the last case, were as follows:

Race.	Number of cases.	Number of deaths.	Mortality.	Ratio of 1 case to —	Date of last case.
American	11	6	54.0	399	1905. Oct. 10
Filipinos	220	200	90.9	862.6	Dec. 31
Chinese	4	4	100.0	5,307.5	Oct. 8
Foreigners	20	15	78.6	227	Nov. 8

From the above table it will be seen that in proportion to their number more foreigners (Europeans) contracted cholera than any other nationality; that Americans ranked next, but had the lowest death rate; and that the least number occurred among the Chinese. The mortality of 100 among the Chinese may be attributed to the fact of the very few cases that occurred and that those who recovered probably escaped detection by the health authorities. That no further cases occurred among Americans after October 10 was probably due to the fact that as soon as they believe the disease to be actually present they observed the prophylactic measures against cholera more strictly. The high percentage of Europeans and Americans attacked may also be more apparent than real, because it is quite probable that all these persons of this race who were attacked promptly sought medical advice, and thus were reported, while among the natives and Chinese in all probability cases occurred which recovered, and thus were not reported.

In the following table is given the death rate per thousand for the years 1903 and 1904, in which no cholera was reported. The death rate for the same months in 1905, during which period 250 deaths from cholera are reported, is also given:

Month.	1903.		1904.		1905.	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
August.....	862	46.17	1,032	55.28	841	45.03
September.....	1,228	67.97	1,064	58.89	1,013	56.06
October.....	1,217	65.19	1,018	54.53	850	45.51
November.....	974	53.91	957	52.97	944	52.24
December.....	894	47.89	794	42.53	841	45.03
Average	{ 281.13 56.22 }		{ 284.20 56.80 }		{ 243.87 48.77 }	

From the above table it will be seen that the death rate for the years in which no cholera was reported was actually higher by more than eight per thousand than in 1905, when cholera was reported. The death rate is of particular importance, in view of the fact that an increase in the mortality has been almost universally accepted as being a strong factor in indicating that deaths from communicable diseases were occurring.

Many epidemiologists who have written upon this subject in the past have laid especial stress on the fact that where it was difficult to obtain the actual cause of death that an increase in the number of deaths should be regarded with suspicion.

A study of the cholera cases, by occupation, shows that they are rather evenly distributed, and no particular deduction can be made.

It will now be interesting to consider whether the infection was introduced from without, and in this connection it will be important to ascertain in what other near-by countries cholera was present at the time it made its appearance in the Philippine Islands.

Manila is in active communication, by direct steamship lines, with the following Oriental ports: Yokohama, Kobe, Nagasaki, Moji, Shanghai, Amoy, Hongkong, Saigon, Singapore, Rangoon, Calcutta, Madras, Bombay, and indirectly with Sourabaya and a few other Javanese and Bornean ports. Examination of the official sanitary statistics received from the ports mentioned dis-

closes the fact that cholera was present in an isolated manner in the country to the back of Kobe, Japan, in Calcutta, and in Bombay. In the case of the two latter ports the sailing time to Manila by the most direct steamers is at least nine or ten days from Calcutta, and at least fifteen days from Bombay. In view of the fact that the incubation period is only five days, and that no sick were found upon any of these vessels, and that from laboratory experience it has been ascertained that vegetables and other cargo which come from those ports will not serve as media for the growth of the cholera bacilli for a greater period than five days, shows that for practical purposes these two ports may be dismissed from further consideration. At any rate the only importations from India are rice, onions, potatoes, textiles, ivory goods, and other articles not at all likely to convey cholera organisms. No cholera was reported in Hongkong and none was known to exist in Canton, but in view of the fact that the actual status of the public health in Canton is not well known at any time, that place can not be excluded with any degree of positiveness. The time from Canton to Manila, by way of Hongkong, would require at least from four to five days, but in view of the fact that only onions, potatoes, garlic, and such other vegetables were shipped from these ports, which are necessarily forwarded in a dry state, it is not likely that cholera organisms could have been introduced with them; furthermore, no sick were found on any of the vessels which entered the Philippines from Hongkong, so that it is reasonable to exclude that port from the list of places likely to have been the cause of the introduction of the infection.

The records show that from Kobe a number of vegetables were shipped, but they consisted principally of onions and potatoes, and a very small amount of cabbage. The vessels that arrived from that port for the month preceding the outbreak of cholera in Manila did not have any cases aboard which were in any way suspicious of cholera. In view of the fact that cabbage is the only vegetable which could likely have been the cause of the introduction of cholera, and since at least five days is consumed in the voyage, and more time must necessarily have elapsed before it could have been placed on the market, and since experiments made in the laboratory of the Public Health and Marine-Hospital Service show conclusively that cholera organisms can be kept alive on cabbage for longer than five days, this method of the introduction of the infection may also be excluded. The only other articles which are open to suspicion, imported from Kobe, Japan, are classes of food peculiar to the Japanese, and which are not eaten by other nationalities. Many of these consist of vegetables in a fermented state, which in itself precludes the possibility of cholera organisms existing therein, and, furthermore, since no Japanese persons are known to have been attacked in the city of Manila until the disease was present at least five days, and after more than 25 cases had occurred among other nationalities, it is not likely that the infection can be ascribed to Japanese food products.

From the foregoing, it will be observed then, that so far as it is possible to tell from the records, it is not likely that the infection gained entrance into the Philippine Islands from without.

The disease slowly spread to the provinces, as may be seen from statistical tables which are given elsewhere in this report, but at no time did it reach much beyond 75 miles from Manila. Toward the beginning of May, the disease had almost entirely disappeared from the islands. Between May 22 and June 2, there was not a single case reported either in the city or in the provinces. On this latter date, however, a case made its appearance in Pasig. From June 2 to June 9 no further cases were reported. Upon this latter date, however, Pasig again showed 3 cases; on June 12, 4 cases; June 14, 5 cases, and on the 18th, 7 cases were reported. The importance of the presence of the disease at Pasig, will be appreciated when it is understood that it is the center through which a large part of the traffic into and out of the provinces of Laguna and Rizal passes. It has a railroad line, river steamers, and wagon roads and trails which lead in various directions. It has numerous market places, and is a distributing center. On account of the foregoing, the appearance of the disease at Pasig was more serious than it would have been at many other provincial towns.

About June 18 the disease appeared more or less simultaneously in the towns of San Felipe Neri, Pandacan, and Cainta, in the province of Rizal, and Siniloan, Pila, and Bay, in the province of Laguna, and in Malolos in the province of Bulacan, and in Angeles, in Pampanga. The advocates of the theory that the disease is propagated by some fermentation or other mysterious process which goes on in the soil, immediately came forward and pointed out that this was

a full justification of their claims. At best, this explanation could not be regarded as satisfactory, and it is much more probable that the simultaneous appearance of the disease can be attributed to the returning pilgrims from a visit to Antipolo, who stopped in Pasig and probably purchased some vegetables which had been fertilized with liquid human excrement that contained cholera organisms.

Owing to the proximity of the disease to the Manila watershed, it was deemed advisable again to request that the Mariquina valley, in which the watershed is located, be patrolled by a military guard, to prevent its pollution.

The disease again gradually established itself in the same province in which it had been encountered earlier in the fiscal year, but in view of the fact that the outbreak has extended into the beginning of the next fiscal year, the matter will be reported more fully in the next annual report.

In mapping out a campaign for the suppression of the disease the work was divided into four parts:

- (1) Isolation of the sick in the cholera hospital and the rigid disinfection of their houses and effects.

- (2) The protection of the city water supply, including the closing of wells located in the city of Manila.

- (3) Prohibition of the sale of food-stuffs likely to become contaminated and the proper protection with fly screens of the remainder.

- (4) The education of the public in the precautions to be observed in evading the disease.

1. The carrying into effect of the isolation of the sick and their treatment at the cholera hospital was so well organized, as the result of the experience gained in the former epidemic, that this particular feature worked very smoothly; but in other respects the work was attended with considerable difficulty, on account of the strong antipathy of the Filipinos to be treated elsewhere than in their homes.

No attempt was made to quarantine contacts, nor was any attempt made to institute a land quarantine at any place in the islands. This was a radical departure from the manner in which the epidemic of 1902 was conducted. The infection was followed from center to center, the sick were isolated, and every practicable measure was taken to destroy the infection and thus prevent its spread. It is believed that this method was of more value than an attempted quarantine could have been, as the latter would necessarily have had to be too despotic to have been of any permanent value. The policy was to educate rather than to antagonize, and what has been lost in some respects has been more than compensated for in others. By comparing the spread of the disease during this epidemic with that of the previous one it will be seen that the disease actually spread slower this time than before. To quarantine effectually the infected area in and around Manila, not to mention the provinces, would have required from thirty to fifty thousand armed men, and unless a quarantine is made effective it is useless. The cost of maintaining such a quarantine and the salaries for guards and delays and losses to business would have been enormous.

It may be contended that the infection this time was milder in character and for that reason did not spread, but when it is remembered that the mortality was over 90 per cent and that nearly all the victims succumbed in a few hours after the first symptoms appeared, and, almost without exception, the disease spread rapidly unless prompt disinfection was done, it will be seen that this contention has very little ground upon which to rest.

The beneficial effect of not alarming the populace, and thereby causing a great emigration from the centers in which the disease appears, can scarcely be overestimated. By the plan followed out cases of cholera, instead of being carried far and wide in every direction, were confined largely to Manila, where they could be promptly isolated and the necessary disinfection performed, the consequence of which, of course, was that there was little danger from the spread of infection in such cases.

The one idea that was kept constantly in mind was to so arrange the inspection system that the disinfectors could reach the cases in the shortest possible time. The disinfection was made as simple as possible and strict instructions issued that nothing must be destroyed or damaged, with the possible exception of the prepared food which was found in the houses. The stools of the patients and the places where they were thrown and the clothes which they soiled were diligently sought for and thoroughly disinfected with a 1 to 1,000 bichloride solution or a 5 per cent carbolic solution. The floors and walls were

thoroughly saturated with the same solutions by means of a pump. All containers in which water was stored, as, for instance, water coolers, earthen jars, filters, barrels, wells, etc., were treated with permanganate of potassium. Contacts were required to take an antiseptic bath. The disinfecting carts were maintained much the same as the fire department. The horses were kept hitched up night and day, and when a report was received they reached the infected house a few minutes later. From the fact that no second case occurred in any house tells most effectively how efficiently the disinfection was done.

2. A few days after the outbreak of cholera in Manila a few isolated cases of cholera were carried to the watershed from which Manila obtains its drinking water. These cases probably came from Tay Tay, a small town in Rizal province, located near the watershed. The importance of properly guarding the water supply of a city of 219,000 inhabitants will be readily appreciated. Arrangements were promptly made for sending an adequate patrol to the Mariquina valley to prevent the pollution of the water. Through the courtesy of the commanding general of the Philippines division, four troops of the Eighth Cavalry were promptly ordered to the valley and remained there until long after the time that the last case of cholera was reported. The watershed is inhabited by about 10,000 persons, and from time immemorial it has been their custom to bathe and wash in the Mariquina River, from which the Manila water supply is drawn. To deprive them suddenly of this privilege produced great opposition among the people and made it most difficult for effective work to be done. For that reason great credit is due to the American troops on account of the great patience which they exercised. From the fact that the river was not polluted, although many cases of cholera occurred immediately along its banks, shows most conclusively how effectively the troops carried out the duties to which they were assigned.

As an additional protection during the time that the cholera on the watershed was at its height, it was deemed advisable to place a sufficient amount of copper sulphate in the city reservoirs to make a solution of 1 to 2,000,000. Subsequent experiments made at the laboratory, however, with the regular city water showed that at least 1 to 150,000 would be required to kill cholera organisms with certainty in thirty minutes' time. As this would be unsafe for drinking purposes after continued use, it is, of course, obvious that cholera organisms can not be successfully removed from public water supplies by the use of copper sulphate.

In the city of Manila there are yet a great many wells; most of them are said to be used only for the purpose of sprinkling streets, washing carriages, and other uses, but the danger is always present that they will be used for drinking purposes, and for that reason an order was issued closing all wells in the city of Manila.

After the city mains were protected and the wells were closed, it could almost be said with certainty that no large epidemic could take place in the city of Manila, and this proved to be the case.

3. One who has never seen the local native markets will perhaps have difficulty in appreciating the great variety and kinds of food-stuffs that are offered for sale and the ideal culture medium which they offer for cholera organisms. Some are composed of snails, some of fish of various kinds, some of crabs and other shellfish, many of cooked vegetables, etc. There are also many green vegetables which of necessity must be continually watered in order to keep them in a fresh condition. The great amount of handling by the fingers of prospective buyers, which all the food-stuffs in the public markets receive, makes it clear that they are likely at any time to become contaminated by persons who are either in the incubation stage of cholera, or have come in contact with infected material.

The chewing of the betel nut has long been under suspicion as being, perhaps, the most common manner by which cholera is propagated and continued in the Philippine Islands. This practice consists in extracting the kernel from a nut that is about from five to eight centimeters long, with a diameter of two centimeters. The outer cover of the nut is a thick husk, comparable to that of the green walnut or butternut of the United States. The kernel, when extracted, is cut into disks, each of which is wrapped with a piece of moist green buyo leaf. It is in this leaf that the danger is supposed to lurk. In order to keep the leaves in good condition they are kept in an earthen pot and thoroughly sprinkled with water every few hours. As new supplies of the leaf come in, the old water that accumulates in the bottom of the vessel is not always replaced by

fresh water. Each prospective purchaser of the buyo leaf usually handles with the finger all the leaves that are found in the pot in order to find those which are most tender. In this way the buyo leaves in a given vessel are probably handled by different persons many hundred times each day before they are finally disposed of, and if there is any cholera in the neighborhood, it is quite easy to conceive how, sooner or later, a person who has cholera organisms on his fingers will come in contact with the buyo leaves. To prevent the sale and the use of the betel nut and this buyo leaf is probably one of the most difficult things which the bureau of health had to attempt. Confirmed betel-nut chewers are almost as insistent upon having their chewing material as the average opium habitue is in obtaining his supply of opium, and they will go to every possible trouble and risk in order to obtain it.

Street peddling was entirely forbidden. The sale of fruit that grew well above the ground, as, for instance, those things grown on trees, exemplified by bananas, coconuts, mangoes, and other fruits, was not interfered with to any great extent. Those fruits, fortunately, are not handled very much by prospective buyers before being bought, and therefore are not likely to become contaminated. Some of the cheaper articles which were absolutely indispensable to the poorer classes were permitted to be sold, provided the shopkeeper agreed to keep the product under fly screens and prevented intending purchasers from handling the same.

With the aid of the police these regulations were fairly well carried out and perhaps aided considerably in preventing the spread of the disease.

4. This was probably the most important work which was done by the bureau of health, and the success in controlling the outbreak was no doubt largely due to the cooperation which was given.

In order to place something practicable before the public—something which required very little expense, trouble, or knowledge to carry it out—the following simple rules were printed in the newspapers and then issued in the form of a handbill in English, Spanish, Tagalog, Ilocano, Visayan, and other native dialects:

1. Boil all drinking water and place it, while hot, in covered vessels. Do not dip up the cup when needed, but pour it into drinking cups; otherwise cholera germs may get into the water from the hands.

2. Do not touch drinking water or food with the hands unless they have just been washed in water that has been boiled.

3. Eat only cooked food. Avoid all fruits, raw vegetables, and raw fish. Dried fish may be made safe by thoroughly heating. Fruits may be made comparatively safe by dipping them a few seconds into boiling water.

4. Flies may carry cholera germs on their feet from human excreta to food; therefore to protect it from flies cover all food immediately after it is cooked.

5. If cholera appears, build smudges under houses to drive flies away.

6. Boil all water used for diluting milk.

7. Cook all meats and fish thoroughly, so as to heat the same throughout.

8. Keep kitchen and table dishes thoroughly clean and scald them before using.

9. Keep the place in which you live, the ground under the house, and everything pertaining to it, clean.

10. Outhouses, closets, and vaults can be made safe by putting in lime or carbolic acid. When this can not be done, dejecta must be buried or thoroughly covered with earth.

11. Isolate all the sick. It is recommended that a house in each barrio be set aside for this purpose.

12. All the dead should be embedded in lime and buried 3 feet under the surface.

13. Filth or vomit and the dejecta of the sick should be promptly cleaned up with boiling water and buried.

14. Clothes and bedding used by sick persons must either be burned or boiled. Do not wash any clothes near wells or springs or permit surface water to run into any well or spring.

15. Municipal presidents and municipal councilors should enact these rules as ordinances and see that they are enforced.

16. All school children are requested to inform their parents of these rules, which, if observed, will prevent great loss of life.

The bureau of education sent these circulars to every school-teacher in the islands, with instructions that the rules should be taught to all pupils so that

they could recite them, and then the pupils were requested to repeat them to their parents. The archbishop of the Catholic Church of the Philippine Islands sent the circulars to every priest, with instructions that they should explain their contents to their parishioners. The Aglipay Church, and other denominations, did the same. Very large, flaring, red cardboard posters, with the rules printed in several languages, were posted in the post-office, municipal buildings, and other public places throughout the islands. Later a more advanced cholera circular was prepared for the use of teachers. The information contained in these later circulars enabled many teachers to cope successfully with the cholera when it made its appearance in the small towns in which they were at work.

Many thousands of Filipinos soon learned that they could easily avoid contracting the disease. How different was this picture from that presented in 1902, when only fatalistic indifference was shown, and the only measures taken by the natives themselves consisted in nightly religious processions. With the exception of a few towns where dense ignorance prevails, these latter were scarcely ever encountered. The number of persons who boiled their drinking water was astonishing.

One of the regrets of the year is the fact that the present cholera outbreak in the Philippines did not offer an opportunity for making a proper and adequate test of the usefulness of cholera vaccine as a means of stamping out cholera. A number of attempts were made with this end in view, but all of the data which resulted was unsatisfactory from a scientific standpoint. For instance, during the outbreak which occurred in Bilibid prison in August about half of the inmates of the institution were inoculated, the other half being allowed to remain uninoculated. At the same time that inoculations were commenced vigorous ordinary sanitary measures for the eradication of the disease were also begun, and four days afterwards no further cases of cholera occurred. In view of the fact that the disease stopped as suddenly among the uninoculated as among the inoculated, it is impossible to draw any conclusions of the value of inoculation.

In the town of Siniloan, province of Laguna, where such remarkable success was had in stamping out cholera, about one-half the population was inoculated, but ordinary sanitary measures were started at the same time that the inoculations were commenced, and three days afterwards the disease had entirely disappeared. This is another instance where the disease disappeared just as quickly among the uninoculated as among the inoculated. A similar experience was had in the town of Angat, province of Bulacan.

During the latter part of June it was reported that the presidente of the municipality of Siniloan had died of cholera. In view of the fact that there was no further spread from the disease, it was thought that probably the prophylactic inoculations made some months previous had had some beneficial influence in preventing its spread, but in the town of Bay, province of Laguna, there also occurred one case of cholera, and there was no further spread. In view of the fact that no inoculations were made in Bay, it again makes it impossible to draw conclusions.

In view of the great difficulty in vaccinating large numbers of persons, it is problematical whether vaccination with a view to suppressing cholera will ever be a thoroughly practical measure, especially in view of the fact that it is not thought to afford protection for a longer period than six months. It is quite probable, however, that prophylactic inoculations against cholera will be of some assistance in stamping out the disease in the future. It will also be valuable in affording those an opportunity who desire to be protected from cholera to come forward and be inoculated. This will apply especially to sanitary inspectors, physicians, and others whose work is at short range with the disease.

CONCLUSIONS.

1. From the evidence obtainable at this time, it is impossible to state whether the cholera was reintroduced into the Philippines or whether it remained here in some latent form during the year and a half in which no cases were detected.

2. While there is no evidence to show that the disease spreads by other means than that of enteric fever, yet the rapidity with which it makes its appearance in many widely separated places puts it in an entirely different class so far as combating it successfully is concerned.

3. That maritime quarantine can practically insure the prevention of its spread by sea.

4. That it is practically impossible to make land quarantine effective; hence, it is useless to engender the opposition with which it is usually met, and the time and money required by quarantine will yield much better results by the education of the public as to the manner in which the disease spreads.

5. That education of the public is a much more effective measure in the suppression of cholera than methods that depend upon force for their application.

PLAGUE IN THE PHILIPPINE ISLANDS.

Measures for combating and eradicating plague from the Philippines have been steadily carried out since the first appearance of the disease in 1899. It is satisfactory to report that during the past three years there has been a steady decline in the number of cases, and for the year ended June 30, 1906, only 22 cases and 18 deaths were reported. This is a material reduction over the number reported for last year. Much of the credit for this satisfactory condition of affairs can no doubt be attributed to the permanent sanitary improvements that have been made in the houses located in those districts in which most cases of plague were heretofore found.

From December 26, 1899, to June 30, 1906, a period of about six and a half years, 1,100 cases of plague have been reported in Manila, of which 938 were fatal, giving a case mortality of about 85 per cent. The only other places known to have been infected are Cavite, Naic, and Cebu, from which 71 deaths from plague were reported for the same period as stated above for the city of Manila.

For the first time in a period of over a year infected rats were found in a number of sections of the city during the month of March. In view of the statements recently made by Professors Kitasato and Shiga, of Japan, that an outbreak of human plague can almost be predicted with certainty within a period of sixty days from the time the first infected rats were found, it is very satisfactory to report that even though ninety days have elapsed since infected rats were first detected so far not a single case of human plague has occurred, and no plague-infected rats have been found for a period of thirty days.

Upon the discovery of plague-infected rats, most active measures were taken for its suppression. A large force of rat catchers was employed, which operated all over the city, the idea being to ascertain the extent of the infection. Radiating lines were drawn from the infected center to the outskirts of the city, and rats were caught in all sections of the city covered by the lines in question. It was soon learned that the infection among the rats was confined to two centers—one in the district of Binondo, in a large block which is bounded by Calle Rosario and the Escolta, and the other, a small block, situated on Calle Principe, in the district of San Nicolas, in which neighborhood much plague has been encountered heretofore.

A large number of rat catchers were sent into these infected centers, and, so far as possible, all rats were caught and destroyed. The thorough disinfection of the whole infected area was then commenced. All goods were moved, to make sure they harbored no rats, and everything, unless entirely new and unused, was thoroughly disinfected with a bichloride solution. This work was continued, story by story, until the ground floor was reached, after which the entire premises surrounding the building were cleaned up. Wood piles were found to be favorite harboring places for rats, and these were invariably torn down and replaced upon sites that had been previously made rat proof. All rat runs were destroyed, drain and open spaces connected with buildings or infected premises were cemented, and other repairs made which seemed to be indicated. This work occupied almost two months time, but so far the results that have been obtained have fully justified the outlay.

The results obtained with plague in the city of Manila during the past year are particularly satisfactory when it is remembered that the number of cases of plague in Hongkong and Canton this year has been much greater than has occurred in previous years. Several cases of plague were detected upon foreign steamers that entered the harbor, but the effective measures which were taken by the quarantine service have prevented the reinfection of the city.

It is extremely regretted that exact knowledge with regard to the transmission of this disease has not been materially enhanced during the year, but the experience of the bureau of health, on the whole, during the past few years may be stated to point to the fact that the same measures which result in the eradication of rats, mice, and other vermin usually prevent the transmission of plague.

VACCINATION.

During the year 950,125 persons were vaccinated by regular vaccinators employed by the bureau of health and reports have been received that 295,768 persons were vaccinated by provincial and municipal officials, which makes a grand total of 1,245,893 persons vaccinated for the year. There were 2,180,692 units of vaccine virus distributed. Of the 950,125 vaccinated by regular employees of the bureau there were 345,227 known "takes."

The provinces which have been systematically and completely vaccinated are: Cavite, Rizal, Laguna, Bataan, Tablas, Cagayan, Isabela, Ilocos Sur, and the island of Siquijor. The provinces which have been almost completely covered are Ilocos Norte, La Union, Batangas, and Cebu, and much work has also been done in many other provinces. In all there have been 1,849,394 systematic vaccinations performed, which leaves a balance of 4,656,827 yet to be done. At the present rate of progress this will require about four and a half years.

Steps have also been taken, particularly in those provinces which have been systematically vaccinated, to require the local officials to vaccinate the newly-born children. If this latter work is done properly the day should not be far distant when smallpox will disappear from the Philippines.

For the first time in the history of the Philippine Islands glycerinized vaccine lymph, in quantities and in such condition that it retained its effectiveness, was delivered into the interior of the province of Lepanto-Bontoc. Sixteen hundred and nine successful vaccinations are known to have resulted, whereas only failure has been encountered heretofore. This feat was made possible by the Benguet road being opened and in good condition throughout its entire length. The vaccine was shipped on ice and, for instance, if it left Manila on Saturday morning it would reach Baguio by Sunday noon. Here it would be removed from the ice, wrapped in wet leaves or some other cooling substance, and an Igorot runner would deliver it in Cervantes inside of three days. From experience it has been found that vaccine, in the hills, will retain its potency about ten days, so that, in the instances cited above, there remained almost one week during which it could be used effectively. The question of transporting vaccine into the interior still remains a very serious one and not much has been accomplished during the year toward its solution.

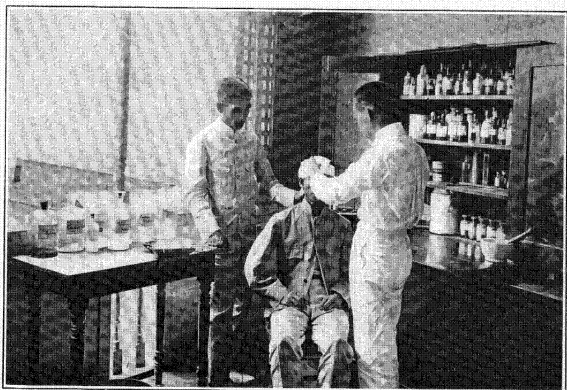
A few hundred dry points were made by the bureau of science and an experiment, but in view of the fact that out of ten previously unvaccinated children who were vaccinated with the points that were received fresh from the laboratory there were no "takes," it is of course obvious that no results could be expected after they became older and were transported to the provinces.

The glycerinized virus that was supplied by the bureau of science during the year was superior to that furnished in previous years, as shown by the high percentage of "takes." Last year the percentage was 33 per cent and this year it reached 47.22 per cent.

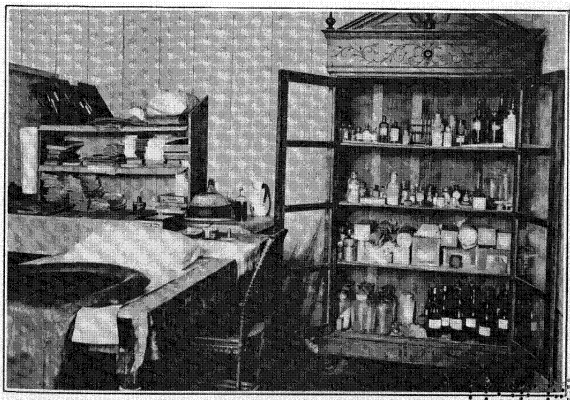
In briefly summarizing the vaccination work for the year it is satisfactory to report that in spite of the fact that the services of many employees engaged in vaccination work have had to be withdrawn for weeks at a time in order to assist with the suppression of cholera, yet 238,689 more persons were vaccinated for an outlay of about ₱24,000 less than has heretofore been the case in any one year.

LEPROSY AND THE CULION LEPER COLONY.

It becomes the very pleasant duty of the undersigned to report that during the year the first steps were taken which, when completed, give promise that leprosy may be finally eradicated from the Philippine Islands. For the past several hundred years the care of those who were unfortunate enough to contract leprosy has received considerable attention in the Philippines, but a careful review of the history shows that this work was more or less of a charitable nature and was not carried out in such a way that the final disappearance of the disease could be hoped for. It was the practice to admit to leper hospitals those lepers who were unable to earn a living or who had no one to provide for them. This left many lepers at large who had not become public charges, and in consequence there was ample opportunity for the disease to spread indefinitely. It was for the purpose of providing complete isolation that plans were made almost at the inception of the present civil government to set aside an island for this purpose, but it was not until this year that they had advanced sufficiently far so that a start could be made toward assembling lepers at that place.

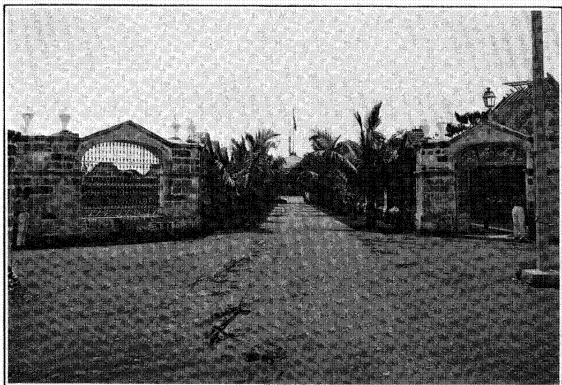


TREATING PATIENTS, FREE DISPENSARY, STATION C, TONDO, BUREAU OF HEALTH.

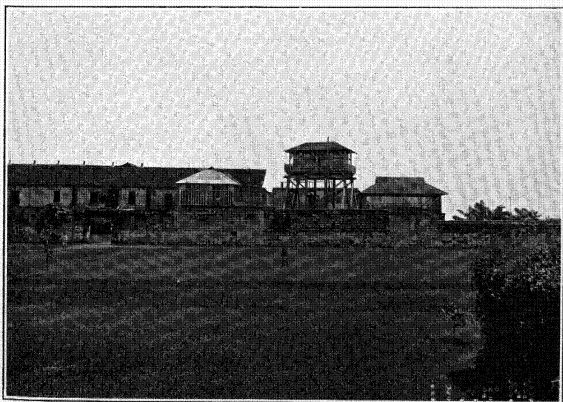


FREE CLINIC, STATION I, SAMPALOC, BUREAU OF HEALTH.

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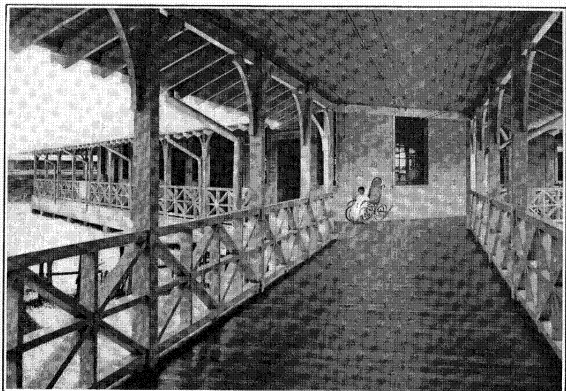


MAIN ENTRANCE, SAN LAZARO HOSPITALS.

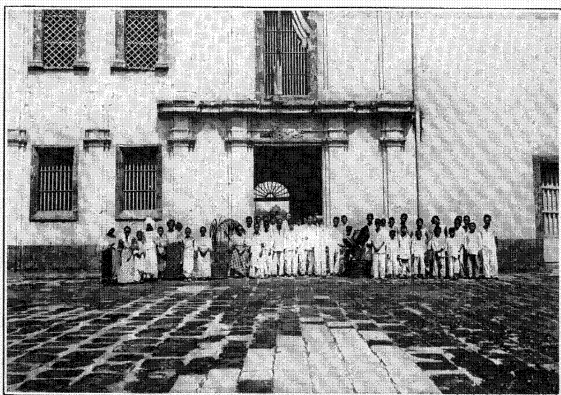


SIDE VIEW, SAN LAZARO HOSPITALS.

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VERANDAS, SAN LAZARO CONTAGIOUS-DISEASES HOSPITALS.

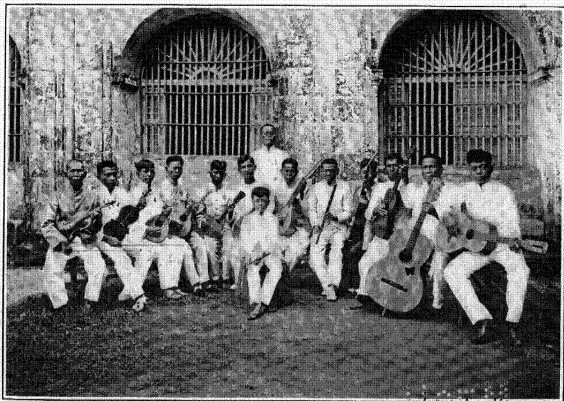


MAIN ENTRANCE, LEPER HOSPITAL, SAN LAZARO HOSPITALS.

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LEPER WARD, SAN LAZARO HOSPITALS.



ORCHESTRA COMPOSED OF LEPERS, SAN LAZARO HOSPITAL.

2001

The construction of the Culion leper colony, situated on the island of Culion, which has been set aside for this purpose, reached a point during the month of May at which 800 lepers could be cared for. Of this number, about 500 are already at Culion. The remaining 300 vacancies will be filled as soon as funds provided by the current appropriation bill for the purpose become available.

It is variously estimated that there are from four to five thousand lepers in the islands. It is furthermore estimated that it would require an expenditure of about 50 centavos (25 cents United States currency) per capita per day by the government for subsistence, material for houses, clothing, transportation, administration, etc., to maintain them all. In round numbers, an annual outlay of about ₱800,000 (\$400,000 United States currency) would be required. The government, at the present time, could scarcely support a fixed charge of this size.

If the immediate segregation of all the lepers in the islands would be an absolute guaranty that no further cases would occur, it would no doubt be advantageous from a business standpoint to borrow money and segregate them at once, because in a few years the charge would be entirely eliminated; but in view of the fact that there is not sufficient medical evidence to the effect that segregation would cause the complete disappearance of the disease, a loan for this purpose would scarcely be justified. Fortunately, however, the geography of the islands is such that the present finances and the demands of practical medicine can both be met to a reasonable degree.

The present plan is to move all the lepers from those islands which are well isolated and at the same time have only comparatively few victims. In this way a large amount of territory, or area, can be freed of lepers at once, and the principal source of infection being removed, there should be few persons attacked in these sections in the future, and the few cases that do occur can be immediately removed. It is contemplated that only such persons shall be declared lepers as by microscopical examination are found to have the bacilli of leprosy in their tissues.

The lepers from the islands of Mindoro, Masbate, Romblon (which includes Tablas and other islands under the same provincial government), Siquijor, Oriental Negros, Occidental Negros, Palawan, and Cuyo have already been moved. One noteworthy fact was observed while the lepers were being collected from the islands mentioned above, viz, only about one-half of those who were previously reported as lepers were, on careful examination, found to be afflicted with the disease. If this same proportion should be maintained in the remaining islands, the number of actual lepers would be much smaller than has been estimated, and the solution of the leprosy problem would not be nearly so serious a matter as first appearances indicated.

The question of the lepers contributing something toward their own support has received most careful attention, but on closer observation of this matter it has been ascertained that not much assistance in this direction can be expected. The disease soon produces such contractions of the limbs, destruction of tissues, losses of fingers and toes, nervous involvements which result in loss of muscular power, general debility, etc., that only a small proportion of them are capable of performing that amount of manual labor which would be required by the agricultural operations which would result in supplying food for themselves. While there are many lighter occupations which a fair percentage are capable of engaging in, yet the things which they would produce would not be of a kind that would be of use to themselves, and the repugnance which the public has for things handled by lepers, even though rendered safe by sterilization, would preclude the possibility of selling them at a profit. Then again, so many of them are entirely bed fast, and the wounds and ulcers of others require so much attention that a good proportion of the services of those not yet so badly afflicted must be devoted to those not so fortunately situated. Domestic duties, cooking, making clothes, keeping house, cleaning and taking care of streets, making repairs to buildings, etc., requires the entire time of many more, so that the sum total of the remaining effective labor is very small.

The question of raising cattle is now being considered. It would appear that this should be a light occupation, in which they would be successful. On account of the fact that cattle do not contract leprosy, that they could be slaughtered by nonleprosy persons, and that the meat is necessarily cooked before being eaten, it would seem that the public would not object to such meat being placed upon the market.

The actual collection and transference of the lepers who are already at Culion did not present as many difficulties as was at first anticipated. On

account of the fact that it was desirable, for administrative reasons, to reduce the number of places at which lepers were kept as soon as possible it was decided to remove those lepers who have heretofore been maintained at the San Lazaro leper hospital in Cebu and discontinue the latter institution. Accordingly, May 22, 1906, Medical Inspector Goff and the undersigned proceeded with the coast guard cutters *Polillo* and *Mindanao* to Cebu. With the assistance of Medical Inspector Pond, who was acting president of the provincial board of health of Cebu at that time, the lepers were transferred by lighters from the leper hospital to the boats. A total of 365 were distributed between the two vessels. The vessels sailed from Cebu May 27, and an uneventful trip was made to Culion, the latter place being reached on the afternoon of May 28. The medical officer in charge of the colony had made all the necessary arrangements to receive the lepers. Four sisters of charity belonging to the order of St. Vincent de Paul were already on duty at the hospital to act as nurses for those who required more or less medical attention. A priest of the Jesuit order, Father Valles, was also already stationed at the colony and aided in receiving the lepers. The latter were very much surprised and delighted with their new quarters and expressed themselves as being thoroughly satisfied with the provision that had been made for them.

The present colony consists of about 125 new nipa houses, each of which is large enough to accommodate from five to seven lepers. These houses have been built on regular street lines, so that a regular town has resulted. The site of this new town is located on a high point which slopes in nearly all directions to the sea, the highest portions being about 150 feet above sea level, the drainage, in consequence, being excellent. A reservoir is located at a height of over 230 feet above sea level, and water from a spring is pumped up to it by a gasoline water pump. From there the water flows to all parts of the new town through the system of water pipes which have been laid. The necessary bathrooms, modern flush closets, and wash places for clothes have been provided. A complete sewage system, which empties into the sea after passing through septic tanks, has been provided to carry away all sewage. Musical instruments have been provided, so that a band of 40 pieces can be organized.

The old town of Culion, of which a number of good houses yet remain which were purchased from former residents, affords buildings for a presidencia or town hall and places of residence for the presidente and consejales. An excellent stone church, which had already been built in Spanish times, is now in good repair and can be used by the inhabitants of the colony.

The lepers are given all possible liberty and are, to a large extent, controlled by regulations which they themselves make. They are allowed to punish offenders against their own regulations in any manner they see fit. In order to give them a proper form of government they were permitted to elect their own presidente and ten consejales. A police force composed of 12 men has also been organized, and it is their duty to see that the town is kept in good sanitary condition, as well as to make arrests of offenders against their own ordinances.

Quarters have been provided for nonleprous employees on the other side of the hill from the colony, and about a quarter of a mile distant. The director of the colony lives in a house which is situated across an arm of the bay about 2 miles distant, and can readily be reached by the launch which is kept at the colony.

After the lepers from Cebu had been transferred it was next decided to remove those from the islands of Mindoro, Romblon, Masbate, Siquijor, Negros, Palawan, and Cuyo. Advantage was taken of the fact that about the middle of June the secretary of the interior was making an inspection of the province of Mindoro, on which trip he circumnavigated that island. On account of his calling at many small ports Medical Inspector Goff was detailed to accompany him, with instructions to collect all lepers on the island, if practicable. It was not possible to collect them all at once, but the work progressed sufficiently far, so that after the secretary of the interior returned to Manila it was only necessary for Doctor Goff to call at two ports in order to secure them all. In the meantime instructions were sent to the local health officials of the other islands, directing them to assemble all lepers in their respective provinces at one seaport. This was fairly well carried out, and Medical Inspector Goff, who was in charge of the collection of the lepers, was able to make a quick trip, calling at the ports of Romblon, Masbate, Capiz, Dumaguete, Bacolod, and Cuyo. He arrived at Culion on the evening of July 4 with 125, only one leper having died en route. On the previous trip from Cebu to Culion no deaths took place. In another

portion of this report attention has already been invited to the fact that not nearly all the persons who were alleged to have leprosy were found to be really afflicted with this disease. Medical Inspector Goff had with him a complete microscopical outfit, and whenever any cases were presented in which the diagnosis was doubtful a microscopical examination was made, and unless the leprosy bacilli were found the case was not taken. In this way the number was reduced to at least one-half of that originally reported.

TREATMENT OF LEPROSY WITH THE X-RAY.

The treatment of leprosy with the X-ray, which was reported in the last annual report, and which gave so much promise, could not be continued during the year on account of the lack of suitable apparatus and the impossibility of replacing it with new before the close of the year. The two lepers reported by Dr. H. B. Wilkinson in the last annual report as having been apparently cured of leprosy, relapsed, and leprae bacilli are again present in the skin scrapings taken from places at which lesions existed before. One of them remained well, so far as it was possible to determine by frequent microscopical examinations, from June 6, 1905, until the first week in March, 1906, and the other from August 11, 1905, until about the middle of February, 1906, leprosy bacilli being again found in both cases on the last dates mentioned above.

It is of course impossible with our present knowledge to state whether there would have been a return of the disease if the treatment could have been extended over a longer period of time. Another important question to be considered is whether these cases actually relapsed or whether they were reinfected. Owing to the fact that they came into more or less contact with other lepers in the institution during the time they remained free from leprosy bacilli makes it quite possible that they might have been reinfected, but the experience in the treatment of leprosy in Germany, and the case treated by army medical officers in the United States, would indicate that it is more probable that our cases relapsed.

STATISTICAL AND OTHER OBSERVATIONS IN CONNECTION WITH PULMONARY TUBERCULOSIS IN THE CITY OF MANILA.

The deaths registered from pulmonary tuberculosis for the fiscal year ended June 30, 1906, were 1,209, or an average of 5.49 per thousand inhabitants. This mortality is considerably higher than that of various countries of Europe and America from the same cause, as may be seen from the following table:

Place.	Year.	Mortality per 1,000
State of New York.....	1890	2.47
State of New Jersey.....	1890	2.34
State of Rhode Island.....	1890	2.67
District of Columbia.....	1890	3.59
Buenos Ayres.....	1901	1.91
Naples.....	1901	2.12
Madrid.....	1901	2.32
Cairo.....	1901	2.27

The high death rate registered in the city of Manila from pulmonary tuberculosis is only approached by that of Calcutta, which, although apparently lower with respect to the males, among Mohammedan women has reached 4.6 per thousand. This high rate may be due to the domestic conditions under which they live, but this latter explanation can not be applied to the cases in Manila. Here it is more likely due to racial predisposition. The appearance of the majority of Filipinos indicates that they are of the phthisical type: A long neck, narrow and flattened chest, sloping shoulders, and poor development of the pectoral muscles are common features, so prevalent in both sexes that they seem to have become the physical characteristics of the race.

The lack of proper exercise among Filipinos, and the poor quality of food taken by the lower classes, often causes organic weaknesses which are favorable to the development of tuberculosis. The habit, common to both sexes, of

tying the clothing tightly around the waist is believed to be the cause of digestive disturbances which are responsible for a poor physical type. The habit of smoking, which is so general among the Filipinos, also weakens them physically, and their carelessness and indifference with regard to spitting multiplies the danger of infection. The custom of eating with the fingers, and the use of the clothing that was formerly worn by a deceased member of the family, in connection with the poor hygiene observed in domestic life, are all facts which tend to explain the rapid extension of tuberculosis among the natives.

It has been asserted on good authority that there is scarcely a native family that has not lost at least one member from this disease or contains someone afflicted with it.

How can this be remedied? This is a difficult matter, because the mere suggestion of interfering in any way with the home life of the people would cause storms of protest. On the other hand, we realize that without their cooperation any efforts tending to suppress or prevent its propagation would prove unsatisfactory and be doomed to failure. The Filipino physicians have now a great opportunity to render an invaluable service to their country by advising the people and recommending to them measures and means directed against the spread of the disease. With very little cost the hygiene of domestic life could be very much improved. Efforts made along this line would be well rewarded by the greatly decreased mortality which would be sure to result.

For the present the prohibition to spit in public places, which has been included in the proposed sanitary code for the city of Manila, and which is now in the hands of the municipal board, should tend to diminish to some extent the propagation of the disease. The placing of spittoons with disinfectants in the churches, in place of entertainment, such as theaters, cockpits, and race tracks, and in railway and street cars, will also help to attain the same end. The free distribution of disinfectants to the poor who have contracted the disease is already being carried on. The construction of more houses for the poor, similar to those which have been built in the district of San Nicolas, should be encouraged.

And finally a proper course of instruction in sanitary matters, including the prevention of pulmonary tuberculosis in the primary schools of the country, will in the course of time, as the teachings are gradually introduced in every home by the pupils, prevent the further spread of this terrible though not so dreaded disease, and avoid the unnecessarily large sacrifice of lives for which it is accountable.

THE SANITATION OF BILIBID PRISON.

The fact that the first case of cholera of the outbreak which occurred in Manila in August, 1905, was found in Bilibid prison has already been mentioned in the article upon cholera which appears in another portion of this report. When it was found that the number of cases in that institution kept steadily increasing, and after 27 cases had occurred, it was deemed advisable by the governor-general that the board of health, which had many more resources at its command than were at the disposal of the prison physician, should assume charge of the sanitation until such time as cholera could be eradicated from the prison. This latter object was attained in three days after the board of health took charge and proved to be most simple in its accomplishment. The result was obtained by screening off the latrines and providing vestibule entrances thereto, so that flies could not pass from the latrines to the food which was served to the inmates. Practically all other measures for its suppression had been taken before the board of health assumed charge. The latrines in question were being filled with sufficient disinfecting solution to keep the level well above the contents; but this did not prove effective in this instance, because, in all probability, some of the solid stools deposited contained cholera organisms, and the fecal matter floated on top of the disinfecting solution, without being entirely immersed. A fly could alight on this floating mass, contaminate its feet, and from there, no doubt, during meal times, would pass to the food of the inmates only a few meters away.

The outcome of the work of the board of health received much favorable comment, and when act No. 1407 was passed, which reorganized certain government bureaus, it contained a provision which placed the then bureau of

health permanently in charge of the sanitation of Bilibid prison from November 1, 1905.

A study of the sanitary history of the prison since American occupation showed that there had been a steady increase in the death rate in the institution. In 1903 the death rate was 72 per thousand; in 1904, 118 per thousand, and at the time this bureau took charge, in September, 1905, it had reached the extraordinary figure of 438.61 per thousand for the month.

Judging from the small amount of air space available per capita, it is believed that one of the principal causes for the high mortality is overcrowding. There were, however, a number of subsidiary cases, which are believed to be important factors. As it was impossible to relieve the overcrowding immediately, these causes were attacked vigorously, so far as practicable. It is satisfactory to report that the death rate, on the whole, has been steadily declining. In August, it was 191.79; in September, 438.61; in October, 126.86; in November, 128.08; in December, 64.24; in January, 43.28, and in May it was 66. There was an apparent increase in the morbidity, but this is accounted for by the fact that every effort was made to have prisoners present themselves for examination when sick. In this way many recruits for the hospital were found, and in view of the fact that the death rate was materially reduced it is quite probable that more cases than heretofore came under observation at a stage of the disease at which it was yet possible to render effective aid.

Among other causes of high mortality are believed to be the insanitary system for the collection of night soil and other discharges. Pails or tubs are distributed throughout the sleeping quarters of the inmates. The persons using them have to perch, often in numbers as high as three or four, on the rim of the receptacle, much in the same manner as birds. On account of the large number of persons in the building, these tubs are almost constantly in use, and it is almost impossible to keep covers on them on this account. The fouling of the atmosphere by the gases which escape can be readily appreciated.

Another most undesirable feature are the present bamboo bunks. These latter harbor all sorts of vermin, from which it is almost impossible to keep them free. Bed-bugs, and even rats and mice, are frequently found in the hollow bamboo. Although very rare outside of the prison, pneumonia is one of the common causes of death within the prison, and it is believed that these bamboo beds are in part indirectly responsible for many of the cases, since many prisoners prefer sleeping on the cement floors, where the air is most vitiated, to sleeping on the prison bunks.

In order to correct these conditions, recommendation has already been made to the effect that each prisoner should have at least $8\frac{1}{2}$ cubic meters (300 cubic feet) of air space; that flush closets be installed, and that the bamboo bunks be replaced by steel-frame bunks, the bottoms of which are to be of canvas or some other suitable material which can be readily disinfected. If these improvements are installed properly, it is not unreasonable to predict that there will be another decided decrease in the mortality rate.

A proper prison hospital should also receive immediate consideration. The present quarters are miserable makeshifts. The wards and rooms are dark and poorly ventilated, and, like the remainder of the prison, it is very much overcrowded. At times the beds must be placed so close together that it is difficult to pass between them. It has been poorly equipped also, but ample provision has been made by the Commission in the current appropriation bill to remedy this defect.

The tuberculosis hospital, known as Hospital B, which is maintained outside of the prison, in another section of the city, is also poorly adapted for the treatment of tuberculosis. It lacks the three most essential factors in the successful management of that disease, namely: (1) Sunshine; (2) a good supply of fresh air, and (3) elevation. It is located on the banks of the Pasig River, on a low, damp site, from which air and sunshine are excluded by tall buildings. However, it must be remembered that it is very difficult to obtain a suitable place near Manila, and the present location was, no doubt, chosen because it is an improvement upon the quarters that were available at Bilibid.

In conclusion, attention is respectfully invited to the fact that the mortality in this prison is much higher than it should be, and the putting into effect the measures already recommended in this report for reducing the death rate should receive immediate consideration.

SAN LAZARO HOSPITALS DIVISION.

The San Lazaro hospitals division during the year has rendered excellent aid to hundreds of unfortunates. The hospitals are gradually going through a stage of evolution and becoming like the most modern institutions of their kind. The facilities for the treatment of cholera, plague, and smallpox are entirely in accordance with modern practice, and are probably not surpassed in any similar institution in any portion of the world. The medical officers in charge of the San Lazaro hospitals during the past year have done much to make attractive not only the hospitals but the grounds as well. With beautiful lawns and shrubberies, it is probably one of the most attractive places in Manila.

The statistical tables of this division will be found in the appendix.^a

CIVIL HOSPITAL DIVISION.

The total number of cases admitted for treatment during the year was 1,523. Of these, 923 were Americans and Europeans, and 534 Filipinos, 26 Chinese, Japanese, and East Indians. There were 1,272 male patients and 251 females, who may be further classified as 890 pay and 633 free patients. Among the latter are included emergency cases and civil employees whose salaries do not exceed ₱80 per month. One thousand four hundred and seventy-two persons were treated by the civil hospital staff and 52 by outside physicians. The total number of deaths which occurred was 34, which gives a death rate for the twelve months of 2.23 per cent of all patients treated. If 8 patients who were received in a dying condition are subtracted from the total, the death rate falls to 1.49 per cent of the total admitted.

The total number of days spent in the hospital by all patients was 24,468. The work for 23,661 days was done by the hospital staff.

The medical officer in charge, with the assistance of 2 house surgeons, prescribed for 15,700 patients. Three thousand and fifty calls were made upon patients outside the hospital and 47,322 in the hospital. The total number of prescriptions filled in the hospital dispensary was 7,684. The total number of dressings done in the operating and dressing room was 10,367. About 850 minor operations were performed upon patients not confined to the hospital.

The personnel of the civil hospital consists of the medical officer in charge, 2 house surgeons—an additional surgeon, who receives board and quarters in return for his services, being available for emergency cases—1 pharmacist, 1 superintendent, 1 clerk and interpreter, 1 chief nurse, 1 dietist, 12 other female nurses, 7 male hospital attendants, 2 native male hospital attendants, 4 Chinese cooks, and 32 servants.

The total receipts for the fiscal year 1906 were ₱38,211.57.

The present quarters of the institution are entirely inadequate, both for hospital purposes and for the purpose of housing the employees who are connected therewith. Plans are now in course of preparation for a new civil hospital, and it is contemplated that before another year passes the construction of the same will be well under way.

Statistical tables, showing diseases treated, will be found in the Appendix.^a

BENGUET SANITARIUM DIVISION.

During the period covered by this report several changes of importance have been introduced, modifying materially the character of the institution, its equipment, and the nature of the work performed. These will be mentioned in the order in which they occurred.

Authority having been obtained from the honorable the secretary of the interior to use cottage No. 1 as a sick pavilion, the ward patients were transferred from the main building of the sanitarium to this cottage about September 15, 1905. This arrangement, removing the sick and all the hospital work from the hotel building, has been found to be a great improvement, giving greater freedom to the guests, and affording a much desired privacy and quiet to those who are really sick, as well as providing more suitable quarters where the increasing number of outdoor patients may be treated with greater facility.

^a Appendix is on file in the War Department, where it may be consulted.

Pursuant to section 5, subsection (b), act No. 1407, the civil sanitarium, on November 1, 1905, became a division of the bureau of health, working under the supervision of, and reporting to, the director of health. In this readjustment of the administration advantage has been taken of every opportunity to simplify the business system and eliminate all unnecessary work. Requisitions for supplies have been filled more promptly and satisfactorily. The division has been furnished with history forms and clinical charts uniform with other divisions of the bureau of health, the latter having greatly facilitated the making and keeping of complete histories of cases treated in the sanitarium.

By virtue of a contract effective March 1, 1906, the government of the Philippine Islands leased the main building of the sanitarium, with its furnishings and adjacent grounds, to Mr. C. M. Jenkins, to be used for hotel purposes. Thus there has been provided a first-class hotel where the general public may come for rest, recuperation, or pleasure, as the case may be; those guests who may need medical attention, but who do not desire to enter the hospital, may be treated at their room in the hotel, provided that they are not suffering from a dangerous or communicable disease.

Since the opening of the main building as a hotel, on March 1 of the present year, cottage No. 5, formerly assigned to the chief of this division for quarters, has been utilized as quarters for some employees and also as surgeon's office, those employees who could not be accommodated there occupying rooms over the storerooms in a building some distance from the hospital. Changes have been made in cottage No. 1, increasing the space and light in the ward and adding two rooms, one of which is used as the superintendent's office and the other as a pharmacy. The building has also been repainted throughout and the doors and windows repaired.

The most important addition to the equipment has been the installation of a complete sterilizing apparatus, consisting of two water tanks, autoclave, and instrument sterilizer, with separate petroleum burners for each, all assembled in convenient relation on one frame.

During the eight months from July 1, 1905, to March 1, 1906, when the main building was opened as a hotel, there were four classes of persons accommodated at the sanitarium, namely, guests, their servants, patients, and the employees of the institution. Of all classes, except employees, there were 669 individuals registered during the above period. The general daily average of the various classes was as follows:

Guests and their servants-----	16.34
Patients-----	9.91
Employees-----	20.34

or a total general average of 45.59 persons subsisted daily.

The highest total daily average was reached in the month of November, 1906, with 52.17 guests, servants, and patients, during the same month the daily average of employees being 27. Since March 1, 1906, there has been a daily average of 9.87 patients in the hospitals and 10.52 employees. For the month of June, 1906, there was a daily average of 10.67 patients in the hospital and 10.47 employees. The above figures do not include members of the Commission and their families, who occupied cottages on the sanitarium reservation, or those persons treated since March 1 of the present year in the hotel.

The table in the appendix will show that the total number of patients treated in the hospital during the fiscal year 1906 was 151. Of these, 31 were Americans and Europeans, 85 Filipinos, 31 Japanese, and 4 Chinese, coming from almost every province in the Philippines. The larger number of Americans and Europeans, however, came from Manila, while most of the Orientals were employed on public works in the vicinity of Baguio.

Eight deaths have occurred during the year; 1 Chinaman, who was injured in an accidental explosion, died a few hours after admission; 1 Chinaman and 1 Filipino died of chronic catarrhal dysentery; 1 American negro and 1 Filipino woman died of general sepsis; 1 Japanese, 1 Filipino, and 1 Igorot died of malarial fever.

Other tables will be found in the appendix, classifying the diseases treated outside the hospital and showing the number of laboratory examinations made, vaccinations, Philippine constabulary examinations for enlistment, surgical dressings done in operating room, prescriptions filled, and visits made.

General sanitary inspections have been made, the laborers' camps have been visited, and foremen instructed with regard to the disposal of refuse, the protection of the water supply, and in the prophylactic treatment of malaria.

DISEASES TREATED IN SANITARIUM.

Malaria.—As a cause of disability, malaria heads the list, 26 cases having been treated, of which 2 died and 1 left without permission. Many of these cases came from a distance—1 from Twin Peaks, 18 miles away, and others from Antimok, about 5 miles in another direction; Twin Peaks being 3,874 feet and Antimok 1,783 feet lower than Baguio. One of the fatal cases had been sick for three months and died a few hours after admission; another was a most severe infection, at least two-thirds of the corpuscles being occupied, some of them containing as many as three parasites. There were 15 of the tertian, 3 of the aestivo-autumnal, and 1 of the quartan variety, 7 cases being undetermined.

Dysentery.—Ten cases of amoebic dysentery have been treated, seven chronic and three acute. Eight of these were cured and two improved.

No special line of treatment has been followed, but each case has been managed according to its particular requirements.

The great value of the climate of Baguio in the treatment of amoebic, or chronic catarrhal dysentery, has been well demonstrated, as all cases treated here have been either greatly benefited or cured. The opinion held by some, however, that one month in Benguet will cure a case of dysentery of six months' or one year's duration is incorrect, the average period of treatment of above cases being sixty-five days.

Seven cases of catarrhal dysentery have been treated, four of which were cured, one improved, and two died. One of the latter was a Chinese, an opium smoker, who had been unable to obtain the drug for two weeks before applying for treatment, and was unconscious when admitted.

Intestinal parasites.—Systematic examinations have shown that intestinal parasites are extremely common. Of 131 cases examined, 97 were found to be infested with one or more varieties, only 18 of which required treatment for this condition alone, the remainder being observed in the course of routine examinations and receiving treatment while in hospital from some other cause. Twenty-nine parasites was the largest number recovered from any one of the 32 cases of uncinariasis, none of which were severe. The four cases infested with opisthorchis sinensis applied for treatment for other diseases and presented no characteristic symptoms.

Of all diseases treated, chronic dysentery, either amoebic or catarrhal, responds to the beneficial effects of a change from the lowlands to the cooler climate of Baguio, most noticeably, but general debility, whether secondary to previous disease or induced by overwork and long sojourn in a warmer climate, is almost equally benefited by a timely change to the higher altitude and more bracing atmosphere.

Nervous diseases, such as melancholia and neurasthenia, are not greatly benefited except in the early stages, and unless the improvement is prompt such cases should be returned to the United States when possible.

The accompanying table of weather statistics for the twelve months ending June 30, 1906, has been condensed from data furnished by courtesy of the local observer of the weather bureau, Mr. Gregorio Galvan:

Highest official temperature during year, 81° F., on March 28, 1906.

Lowest official temperature during the year, 41.4° F., on November 8, 1905.

Highest monthly average or mean temperature, 74.78° F., during the month of April, 1905.

Lowest monthly average or mean temperature, 42.80° F., during the month of February, 1906.

There were one hundred and forty-nine days during the year in which rain fell, and the rainfall for the period reached a total of 194.33 inches. The highest monthly rainfall was 53.31 inches, in May, 1906, and the lowest 0.03 inch, in February, 1906. The maximum rainfall in twenty-four hours was 23 inches, on August 29, 1905.

While no appropriation was made for the improvement of the sanitarium grounds, the boys employed in routine outdoor work, when not required at their regular duties, have applied all available time to repairing roads, walks, and drains, and to the transplantation of ornamental plants and shrubs. By means of stone retaining walls and fills a wagon road has been constructed around the front of the main building, enabling all vehicles to approach by the main entrance, this obviating the confusion experienced last year, when the stages arrived at the back of the building, where there was insufficient room for baggage and passengers.

The food supply, always of importance in the treatment of the sick, but more especially so in the Tropics, has been more satisfactory this year than heretofore. The experimental station of the Bureau of Agriculture at La Trinidad has furnished a large variety of fresh vegetables of first-class quality, which, in addition to the vegetables, poultry, and game supplied by the natives, and fresh meats, fish, and butter brought from Manila and Dagupan, make it possible to provide diet suitable for any case in the hospital.

Recommendations.—The officer in charge of the division has invited attention to the poor facilities that have existed since the main sanitarium buildings were turned over to private parties for hotel purposes. The present accommodations are entirely inadequate, and it was understood when the former buildings were given up that provision would be made for better facilities. At the present time plans are actually being drawn for a hospital suitable for the needs of the division. It is believed that the Commission will appropriate the necessary funds for its construction during the year.

SANITARY ENGINEERING DIVISION.

The number of orders issued during the fiscal year for the improvement of defective drainage, leaking vaults, proper systems for the disposal of excreta and urine, defective light and ventilation, defective plumbing, etc., has been greatly in excess of the number issued during the preceding year; and whereas in the previous fiscal year only about 50 per cent of the orders for work issued were completed, this year about 80 per cent of those issued have been complied with. The result was brought about in spite of the fact that the time of the sanitary inspectors detailed for duty in the sanitary engineering division was was much taken in combating cholera.

Three hundred and fifty buildings were recommended for removal, but very few were actually removed, and as the matter now stands it is practically impossible to secure the razing of condemned houses. Even in cases in which the municipal board has authorized the removals the advisory board has frequently taken the matter up and secured a reversal or a postponement. In other cases injunctions were granted by the court.

The barrio of Rosario, in the district of San Miguel, in the condemnation of which the police department, the fire department, and the bureau of health concurred, and which is notoriously one of the most insanitary sections of the city, could not even be brought about.

A good portion of the time of the chief of the sanitary engineering division was taken up with work at the Cullion leper colony, and during the latter part of the fiscal year he superintended in person the construction of a number of buildings and other installations for nonleprous employees. Considerable time was also required in providing for the sanitation of the Mariquina Valley in order to prevent the Manila water supply from becoming infected with cholera.

A small office detail, which has given considerable satisfaction, was the making of plans and specifications for the installation of the various sanitary appliances which are at present required. Cuts were made and the same printed in the form of circulars and comprise the construction of—

1. Septic absorbing vault.
2. Septic discharging vault.
3. Septic absorbing and discharging vault.
4. Dry-earth closets.
5. Tight vault, without seats.
6. Dry-earth vaults for two or more stories.
7. Absorbing basin.
8. Absorbing and discharging basin.
9. Pocket filter basin.
10. Smoke hood.

The statistical tables for this division will be found in the appendix.^a

SAN LAZARO LEPER HOSPITAL, CEBU.

This latter institution was officially closed May 22, 1906, and the lepers transferred to the Cullion leper colony.

The statistical tables for this division will be found in the appendix.^a

^a Appendix is on file in the War Department, where it may be consulted.

PROPERTY DIVISION.

The division of property not only is accountable for the property of the bureau, but it also performs the functions of a shipping office. The forwarding of supplies to the various institutions in the city and throughout the Philippine Islands requires the most detailed supervision, because many of the things are either drugs or technical apparatus, and the average employee is not familiar with them, and errors are very likely to occur.

The merging of two other complete bureaus, and the partial service of another, with the bureau of health, caused a great increase in the amount of work for the property division.

The shipping of vaccine to the provinces, which has heretofore been in charge of a sanitary inspector, was also transferred to the division of property, and when it is remembered that this one item alone amounted to 2,180,692 units the entire work done by this division will be better appreciated.

The consolidation of the furnishing of Government medicines and medical supplies for the entire islands under this bureau, where all requisition are pressed upon by a medical man, has resulted in great economy to the Government: (1) By the elimination of useless drugs; (2) by using the surplus which has accumulated in one place, to fill the requisitions for another, thus also insuring much fresher drugs than heretofore. A standard supply table has been prepared, thus insuring greater uniformity in requisitions.

CLERICAL DIVISION.

The efficiency of the division has been greatly impaired by the loss of three of its oldest and most valuable employees, due to the resignation of two and the absence on extended leave of a third.

Taking into consideration the size of this bureau and the extent of its operations the work has been performed with a comparatively small force. When the reorganization of the bureau was in progress, after due consideration it was decided to recommend the following personnel for the fiscal year 1906 for the clerical division, which recommendation was allowed by the Commission, being a saving of over ₱20,000 per annum over the personnel allowed for the fiscal year 1905. These figures are all the more remarkable when it is remembered that the efficiency of the division was increased, and that in addition a large amount of clerical work was added by the merging into the bureau of health of two other complete bureaus and the partial merging of another.

	Number.	Salary.	Total.
Chief clerk	1	₱4,500	₱4,500
Clerks	2	3,200	6,400
Clerk	1	2,800	2,800
Do	1	2,400	2,400
Clerks	3	1,800	5,400
Clerk	1	1,080	1,080
Do	1	600	600
Do	1	480	480
Employees	5	360	1,800
Employee	1	240	240
Total expenses authorized			25,700

As the work of the division was systematized it was found that it could be operated still more economically than was at first thought, and the total cost for the operation of the division was only ₱21,060, instead of ₱25,700, as estimated. In other words, with an outlay of ₱21,060 the operations were carried on of a bureau with an appropriation of approximately a million pesos, maintaining four institutions for the care of sick, lepers, insane, etc., two of them outside of the city of Manila, regulating the admissions and the discharges of three charitable institutions, with executive control over the sanitary operations of the entire archipelago, maintaining a force of over 100 vaccinators in the field, distributing thousands of packages of medicines among the indigent in the various portions of the archipelago, providing for the sanitation of the

city of Manila, and other branches of work too numerous to mention. These operations were properly recorded, expenditures made on account of same, properly audited and passed for payment, and the most detailed record of all expenditures made.

So far as is known, no other bureau of like importance in the Philippine government has maintained its clerical division at such a small outlay, and has achieved, on the whole, such satisfactory results, especially in the matter of the closest scrutiny of all expenditures made, and with regard to the exhaustive character of the statistical information which has been kept, relative to such expenditures.

FAILURE OF COPPER SULPHATE FOR PUBLIC WATER SUPPLIES.

Experiments which were made at the laboratory of the bureau of science, at the request of this bureau, in the treatment of the city water supply with copper sulphate, with a view to rendering all the water safe against cholera germs, have shown that this method is a complete failure in actual practice in Manila. The efficacy of copper sulphate placed in the local water supply was thoroughly tested. Solutions of copper sulphate varying from 1-2,000,000 to 1-50,000 were prepared. Cholera organisms which were introduced into these solutions were recovered, in each instance, in all strengths between 2,000,000 and 200,000. In a strength of 1-150,000 no growth could be detected after four hours, and in a strength of 1-100,000 no growth of cholera organisms was found in one and a half hours.

From the foregoing it will be seen that strengths of 1-150,000, acting over a period of at least four hours, would be required in order to make Manila's water safe against the cholera vibrio. This is another illustration that, while copper sulphate was found to be entirely efficacious in the laboratory experiments made by Moore and Kellerman, in much greater dilutions than as shown above, yet in practical application the composition of Manila's water was found to be such that much stronger solutions are required to attain the same results.

If copper sulphate could have been used successfully in the city reservoir it will be seen that Manila could have viewed the presence of cholera upon the watershed with more or less indifference; but in view of the fact that the strength of 1-150,000 would be required in order to render the water safe, it was not deemed advisable to permit the population to drink constantly a copper sulphate solution of this strength. While there may be no immediate danger from copper sulphate in this dose, still an accumulative effect might be expected if the practice should be continued over a long period of time.

Even if the use of copper sulphate should have proven successful a drawback would have been the fact that, in using disinfectants in such a wholesale manner, would have probably interfered seriously with the disposal of the excreta in the city, because the greater portion of it is taken care of through septic tank systems, and if the saprophytic organisms which are essential for the success of this process had been killed off a great nuisance would have been created, not to mention the menace to public health in other directions.

REGULATING THE MANUFACTURE AND SALE OF FOODS AND DRINKS.

One of the provisions of provost marshal general's ordinance No. 15, dated July 15, 1901, entitled "An ordinance regulating the manufacture and sale of food and drink," was to the effect that no meat, fish, or manufactured or cooked food or drink should be sold without first obtaining a license therefor, and that such license should not be issued without the approval of the bureau of health. This ordinance was modified September 11, 1905, by amendment, so as to make it necessary to obtain a license from the bureau of health.

At the present time the ordinances and regulations covering the sale of foods and drinks are scattered through so much legislation that it is almost impossible to present a violation of the law before a court in a satisfactory manner. This is another matter which has been systematized in the proposed sanitary code, and is another reason why the prompt passage of the proposed ordinance is necessary to guard the public health.

During the cholera epidemic of 1902, the infection in many instances was traced to uncovered foods which had been contaminated by flies or by the

hands of customers of the tiendas, but on account of the difficulties of a satisfactory solution of the question no definite action was taken until the cholera reappeared in Manila, August, 1905, whereupon this office recommended the aforesaid amendment and devised a food screen made of a wooden frame and a painted wire gauze, the use of which is made a condition for granting the license. Licenses are revoked for noncompliance with the ordinance.

The effect of the new regulation became apparent at once. The tienda keepers complied very willingly with the requirements when they found that there was no way to evade the ordinance, and provided screens, some by buying them ready-made and others by purchasing the material and making them. These screens have been, beyond doubt, an important factor in the prophylactic crusade against cholera. Frequent inspections are made in order to enforce their use.

The bureau of health, through the various health stations, has issued, under the provisions of the said ordinance, 327 licenses. When an application is recorded at a health station the premises named therein are carefully inspected, and the applicant is told what it is necessary for him to do before license can be granted; on receipt of the second application another inspection is made, and if all requirements are met the license is issued. Since the regulation has become generally known, many licenses have been issued at the first inspection. The same precautions are taken in reference to bottled waters, soda, and other drinks.

TUBERCULOSIS.

Tuberculosis is often called "the great white plague," and is just as deadly in its invasions into the brown man's country as it is among white races. It could be more appropriately called the universal plague, as its deadly ravages are known the world over.

Tuberculosis is a disease which can be prevented, but to do so requires the most thoughtful care and watchfulness on the part of the sick and well, especially of those whose duty it is to care for the sick.

In view of the fact that the death rate from this disease in Manila is 5 per 1,000, it is obvious that one of the most serious problems which confronts the sanitarians of the Philippines, even more than those of any other country, is that of tuberculosis.

The disease could be practically eradicated from the human family by following a few simple but imperative rules of sanitation, but as it is easier to be bad than good, so it is easier to be insanitary than sanitary. Nothing but education will ever stop the spitting habit. Legislate as we may, the filthy, deadly habit still continues. It has been observed that many of the more intelligent are particularly careless in this matter, and so long as those who ought to know better continue the habit with such reckless abandon, it seems almost useless to preach the gospel of sanitation to others.

This bureau is now preparing a pamphlet on tuberculosis, to be placed in the hands of the teachers of the bureau of education throughout the islands.

The municipal board of the city of Manila has recently passed an ordinance against spitting in street cars, and the proposed sanitary code contains a section to the effect that, in order to prevent the spread of pulmonary tuberculosis, all persons are forbidden to spit or deposit any sputum, saliva, phlegm, or mucus on the floor of any church, schoolhouse, public building, or other place of public assembly or street car or other public conveyance or on any sidewalk of any of the streets or highways of the city of Manila.

The disease will also be attacked through the regulation of the sale of milk taken from diseased animals and from every other standpoint possible.

TYPHOID FEVER.

In the last annual report mention was made of the fact that it was believed that typhoid fever was not so prevalent as the statistical tables seemed to indicate. At that time a number of cases had already been investigated by laboratory methods of diagnosis, and a considerable number of them were found not to be typhoid fever. These investigations were continued during the present year, and the results have fully confirmed the presumption that mistakes are frequently made in the diagnosis of this disease.

During the year, 45 typhoid deaths were reported in the city of Manila. Of these, only four were found positive to the Widal reaction. Among those who recovered from diseases diagnosed as typhoid, 9 cases were found positive, or a total of 13 found positive during the year. The mortality was about 30 per cent, which is the usual death rate for this disease in the Tropics.

In the report of the Surgeon-General for the United States Army for the year ended June 30, 1905, it is stated that among the troops stationed in the Philippines 23 cases occurred, with 5 deaths, which gives a mortality of 21.7 per cent.

The disease has made its appearance from time to time in various parts of the islands, especially at places at which troops were stationed. Conditions, however, do not seem to have been favorable for its spread.

During the time the Benguet road was under construction many Japanese laborers were employed thereon. A number of cases of typhoid fever occurred among them, and later a few cases were encountered among the Igorots in that section, but since the removal of the Japanese no further cases have come under observation.

From the foregoing it would appear that conditions are not particularly favorable for the spread of this disease in the Philippines.

In view of the fact that the most common method of spread of typhoid fever is probably by public water supplies or through milk, and, furthermore, that outside of the city of Manila there are no water systems in the Philippines, and that the use of milk is very rare except that which is imported into the country in cans, may account for the small amount of progress which this disease has made in the past; but with the rapid increase in the use of milk in the city of Manila and because of the thickly populated watershed from which the city obtains its water, it is rather probable that Manila is in considerable danger of becoming thoroughly infected with typhoid fever unless the greatest precautions are observed in preventing its gaining a foothold. To this end the watershed is constantly and most carefully watched in order to prevent stools from a possible case of typhoid fever being introduced into the Manila water supply.

In the proposed sanitary code, which is now in the hands of the municipal board for enactment, adequate provision has also been made to guard against infection being spread by milk.

The reporting of cases is compulsory, which makes it possible to carry out proper methods of disinfection.

INTESTINAL AMÆBIASIS (AMŒBIC DYSENTERY).

Amœbic dysentery still easily retains first place as that disease which is the white man's worst enemy in the Tropics. More permanent disability is caused, more time is lost, and more persons are compelled to give up their residence in the islands and seek the temperate zone on account of this disease than from all the other tropical diseases combined.

Although the prophylaxis is so simple, yet the sources of infection are so numerous and so constant that it is not strange that it prevails to such a great extent; however, the number of deaths for the fiscal year just closed shows a diminution as compared with the number of deaths for last year, the same being for the period of this report 280 cases and for last year 313.

While water is the principal source of infection, and the majority of cases can be traced indirectly to the use of unsterilized water, the danger of handling or eating green vegetables and fruits must not be overlooked. The city water supply contains a large number of protozoa and amœbæ and should not be used for drinking purposes until it is sterilized; but it is practically impossible to observe this injunction, as all sources of infection can not be shut off.

This disease affords another excellent example of the amount of good that is constantly accomplished by modern prophylactic medicine when systematically applied. A study of the morbidity statistics showed that for several years a great number of cases of dysentery occurred among the guests of a certain leading hotel in the city. On investigation it was found that all water for the table, although said to be previously boiled, was then passed through a stone filter. A biological examination of some of the contents of the filter showed it to be swarming with amœbæ. The use of the filter was discontinued, and for more than eight months nothing but distilled water has been used on the table, and no cases of dysentery have been reported from that hotel since that period.

BERIBERI.

The record of the past year shows that beriberi has been much less common in public institutions and other places under governmental control than has been the case during previous years.

The number of cases occurring at the light-house stations, at which deaths were so frequent in the past, was practically reduced to nil during the year. In the provincial jails, where the disease has always prevailed to a large extent, only a few cases were encountered. It is believed that this improvement may be safely attributed to the disinfection of the premises in which cases occurred; providing more light and air in the quarters heretofore affected, and changing the diet so that it contained more nitrogenous constituents. The increase in the nitrogen in the diet was principally accomplished by issuing mangoes, which is a sort of lentil, and is rich in nitrogen.

At the Cullion leper colony an outbreak occurred among the lepers that were transferred from Cebu, but in view of the fact that this disease was very common among them at the Cebu leper hospital, it can almost be said with certainty that they took the infection with them to their new home.

In the city of Manila there were 378 deaths from beriberi reported during the year. No cases were reported among Europeans or Americans. In proportion to the population, the Chinese were most afflicted.

Dr. Maximilian Herzog, formerly pathologist of the bureau of science, went to Japan during the year for the purpose of making a special study of this disease, and the result of his observations was published in the Journal of the Bureau of Science.

MALARIAL DISEASES.

During the year there were 169 deaths reported in Manila from malaria, the fatal variety being of the æstivo-autumnal type, which sometimes manifests itself with remittent character and sometimes with malignant character. Many of the diagnoses were, however, not verified microscopically, and it is quite probable that some deaths due to other causes were included.

The natives are believers in the efficacy of quinine and laxatives, but oftentimes they are not resorted to until too late. The masses still adhere to the "bad air" theory of the cause of the disease and absolve the mosquito from all blame, while he goes on with his deadly work.

There are two beliefs held by medical men with reference to the extent of the disease, one being that practically all the natives have malaria in latent form, and the other that it is relatively a rare disease when compared with the ravages in many parts of the United States.

The number of cases reported for the present year, as compared with last year, shows an increase in the number of deaths in Manila of 59, which indicates that the number of cases, as compared with the number for last year, was correspondingly greater.

The work of oil spreading, which the bureau of health had carried on for two years, was temporarily interrupted by the appearance of cholera, but will be resumed as soon as conditions will permit. There are so many places in the city which afford secure breeding places that it is impracticable to treat them all with oil. The abundance of tropical foliage to be found everywhere affords safe retreats.

There was a marked reduction in the number of cases of malaria during the outbreak which occurs annually in the provinces of Ambos, Camarines, and Albay. This can, no doubt, be attributed to the extensive free distribution of quinine which was made during the year in these provinces.

The cholera has interfered with nearly every plan and purpose of the bureau of health, the demands on the service being so great that very little time has been available for other work, and many things that under other circumstances would have been urgent have necessarily been postponed.

AMBULANCE SERVICE.

The system of ambulance centralization having been found very satisfactory in Berlin and other large continental cities, it was determined to give the idea a trial. The merging of the civil hospital bureau with the bureau of health

afforded the necessary opportunity, and the experience of the past year has not only fully demonstrated that it is more economical, but at the same time the efficiency was increased. All ambulances and other transportation used by the bureau of health are now kept at the city stables No. 1. Calls can be transmitted by any police officer, through the private police telephone system, as well as from any health station or city telephone. The facilities of this large and well-managed stable make it practically impossible for delays to occur.

One of the first official changes inaugurated by this office was to regulate the reckless speed of ambulances when answering calls. It has often been demonstrated that, after all, better time will be made by careful driving, so as to avoid accidents, than by the former method, so fraught with danger to the patients, the pedestrians, and light vehicles, and to the service itself. Except in extraordinary cases, reasonable speed is all that is ever required. By the present system the time lost in decreased speed is fully compensated for by the promptness in getting the ambulances out of the stables after calls and by taking the shortest routes, with which the experienced drivers now employed are familiar. The unnecessary clanging of gongs is prohibited, and, in consequence, the patients are moved so quietly from their homes to the hospitals that it is all over before there is time for a curious crowd to assemble.

The ambulances in use by the bureau of health are modern rubber-tired vehicles, and are of three kinds—the first for nonepidemic diseases, the second for dangerous communicable diseases, and the third for the morgue service.

As soon as an ambulance arrives at the stable from a trip it is carefully disinfected by experienced disinfectors before going out again.

MEDICAL EDUCATION.

During the year the Commission has made provision for the establishment of another medical college in Manila, to be known as the Philippine Medical School. The new college will be conducted under government auspices, and the instruction will be given in English. It was hoped to matriculate the first class in June, but it was deemed best that they should take another year of preparatory work in the normal school.

The work of the new college will be conducted along modern lines, all the facilities of the bureau of health and of the bureau of science being made available by the act authorizing the establishment of the school. With the unusual advantages, and with access to the various hospitals and clinics in the city of Manila for practical teaching, it will be possible to conduct a first-class institution modeled after the medical school of the Johns Hopkins University.

The law provides that scientific men employed by the government shall act as instructors and professors without additional compensation.

It is expected that a class of about forty will be ready to matriculate next year. The director of education has arranged the last two years' work of candidates for admission to the medical school so as to prepare them for the work of the course. The school will admit both sexes and no discrimination will be made on account of color or nationality, the only restrictions being those of a moral and educational character; no student who is found to be deficient in education will be admitted, and all of a questionable character are to be strictly excluded.

HEALTH RESORTS.

The Philippine Islands are particularly fortunate in having many places which may be appropriately termed health resorts. The government sanitarium is located at Baguio, Benguet province, the summer capital, about 130 miles from Manila. All that is needed to make this place a veritable Mecca during the hot season is railroad transportation. Nature has blessed it with an invigorating climate, good water, pure air, and pleasing scenery. The completion of the Benguet highway has made the place easily accessible to those who are able to travel. Trains leave Manila in the early morning and at noon every day for Dagupan, from which place transportation may be obtained from the constabulary or from private persons, the time necessary for the entire journey being usually two days.

A new hotel is in operation, with ample accommodations for its guests.

The government has sold a number of town lots in Baguio, and the number

of private cottages will soon be much increased. Plans are now actually in preparation for the construction of an additional hospital building, so that there will be ample accommodation for the sick.

Los Baños, on Laguna de Bay, a few hours' ride by river steamer from Manila, is justly celebrated for its hot springs. The United States Army has established a reservation and hospital there for the treatment of those in the military service.

The therapeutic properties of the water are in all probability due to its thermal qualities, but it is also bottled and sold extensively throughout the Philippine Islands, and considerable quantities are exported.

The McVean baths are open to the general public at a reasonable charge, and many people from Manila visit the resort.

Another resort that was noted in Spanish times is Sibul Springs, in Bulacan province. The nearest railway station is San Miguel de Mayumo, on a branch line of the Manila and Dagupan Railway, which has been recently completed. This station is about 5 miles from the springs, in the dry season about an hour's drive by carromata. Efforts have been made to reopen the springs, but on account of the question as to the ownership of the property nothing has been done yet, though many people visit the springs for the benefits of the waters.

A careful investigation of its therapeutic properties has not yet been made, but it may be safely stated that it exercises a very beneficial influence upon many cases of gastro-intestinal disorders, especially those of a catarrhal nature.

IMPROVEMENT IN WATER SUPPLIES NECESSARY.

The greater number of medical men at present in the islands who have given the matter any thought are of the opinion that the very inferior grade of drinking water used by the people is the cause of a great many diseases and evils.

Cholera is spread undoubtedly more by inferior grades of drinking water than by any other means.

Intestinal worms are disseminated by the same means, and gastro-intestinal disorders of undetermined nature are undoubtedly due to the great number of bacteria present in practically all the waters of the islands. Dysentery is widespread, and is due to water almost invariably.

Examinations of a great number of stools of Filipinos show that it is the exception to find one that does not contain the eggs or embryos of at least one of the following: *Tricocephalus dispar*, *ankylostoma duodenalis*, *ascaris lumbricoides*, *strongyloides*, *intestinales*, *amœba dysenteriae*, *oxyuris vermicularis*; rarely *balantidium coli* and other parasites. *Tricocephalus dispar*, *ankylostoma*, *ascarides*, *oxyuris*, and *amœbæ* are quite common, and are all frequently seen in one stool.

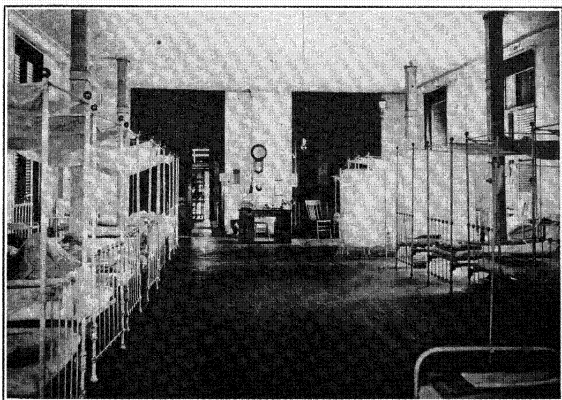
When one stops to think of the anæmias and other complications that follow in those so unfortunate as to have such an array of parasites in their internal economy, one of the predisposing causes for the high infant mortality, for the small stature, poor physique, low vitality, inability to withstand the inroads of disease, low mentality of the poorer classes, with lack of ambition and originality, readily suggests itself.

It is true that the food the average person of the poorer class eats is not of the best quality, and that the variety is limited, and that it is poorly and improperly prepared; but since it is impracticable to correct this immediately, the first and most rational thing to do would be to remove, if possible, the horde of parasites that are using up a large percentage of the food he does get, so that the individual may derive the full benefit of that which he ingests.

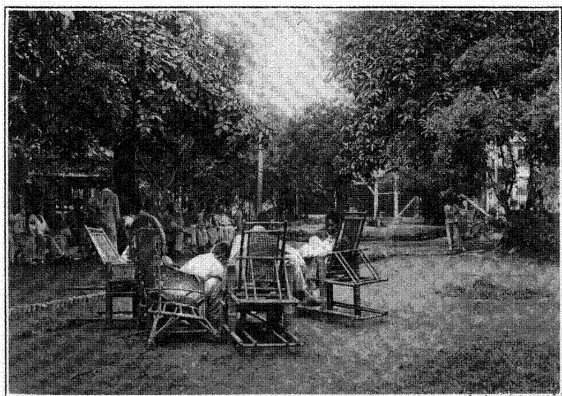
With a few exceptions the towns throughout the islands are compelled to get their water from small rivers, springs, wells, irrigation canals, rain water, and any other source where water can be obtained. The rivers usually have towns on both banks for almost their entire length, and as the only system of sewage disposal is the ever-present pig or fly, the majority of the sewage is carried into the river by the first rain, if it has not been already thrown or deposited there by the people themselves.

Springs are never protected, wells are never covered; rain water collected from nipa roofs is not clean, and soon becomes filled with mosquito larvæ and other insect life.

Realizing that the country can never progress, and the hopelessness of

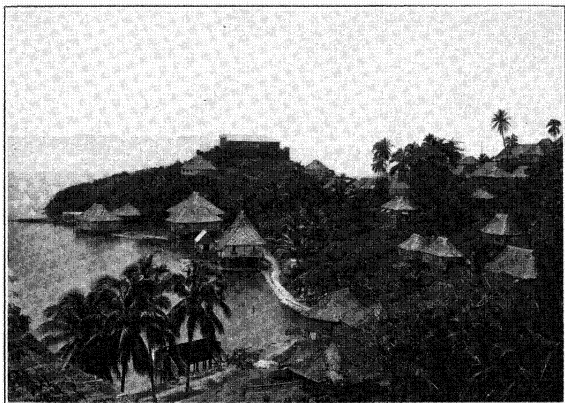


WARD, CIVIL HOSPITAL, MANILA.



YARD AT TUBERCULOSIS HOSPITAL B, BILIBID PRISON.

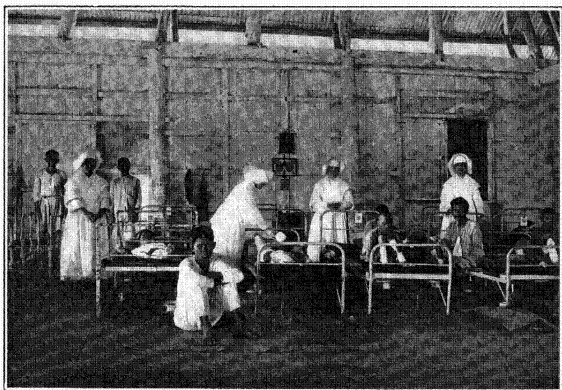
1870



CULION LEPER COLONY, LOOKING EAST.



VIEW OF CHURCH, CULION LEPER COLONY, LOOKING TOWARD EAST.



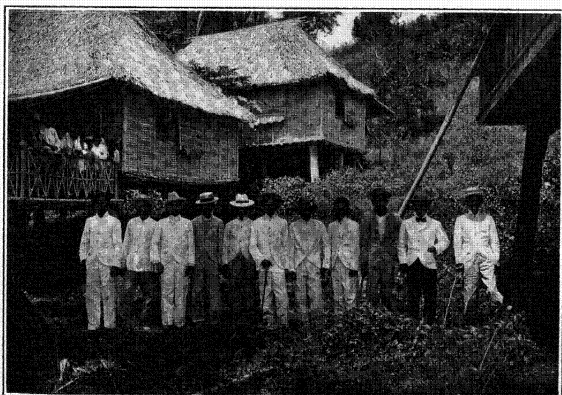
INTERIOR VIEW OF HOSPITAL, CULION LEPER COLONY.



CHAPLAINS, CULION LEPER COLONY.



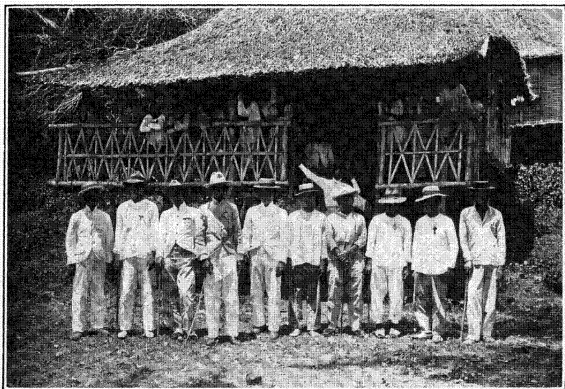
SISTERS OF SAINT PAUL DE CHARTRES ON DUTY AT CULION LEPER COLONY.



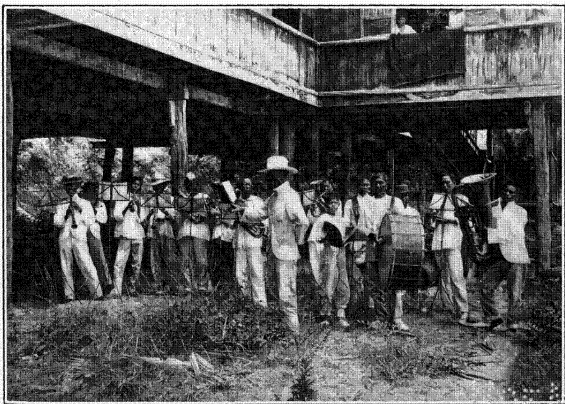
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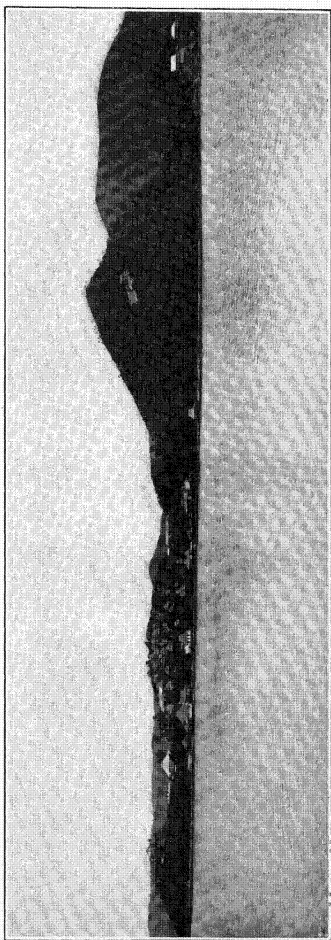


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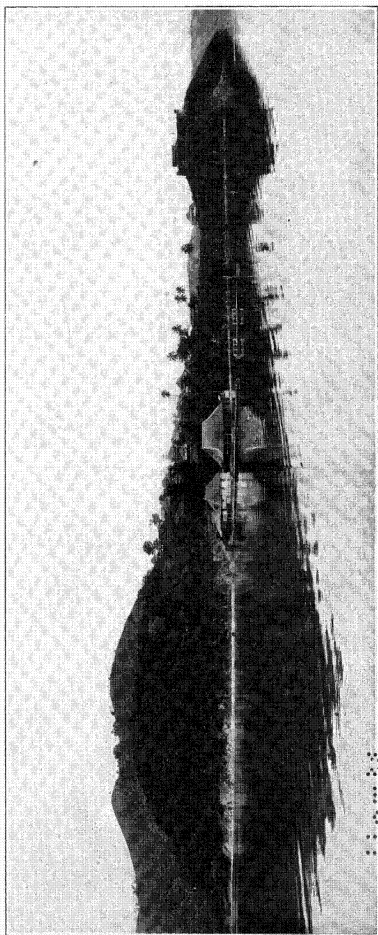
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CULLION LEPER COLONY, LOOKING TOWARD THE SOUTH.

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CULION LEPER COLONY, LOOKING TOWARD THE NORTH.

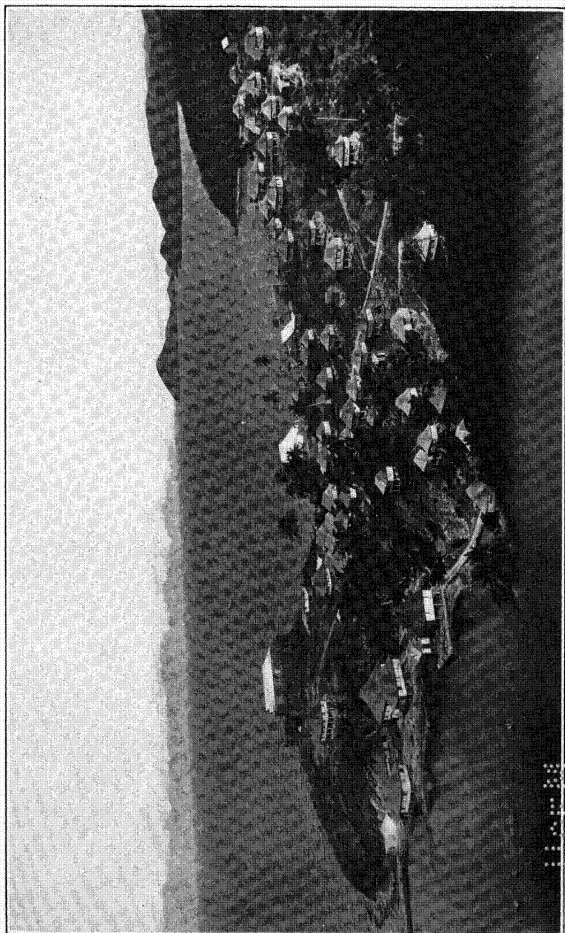
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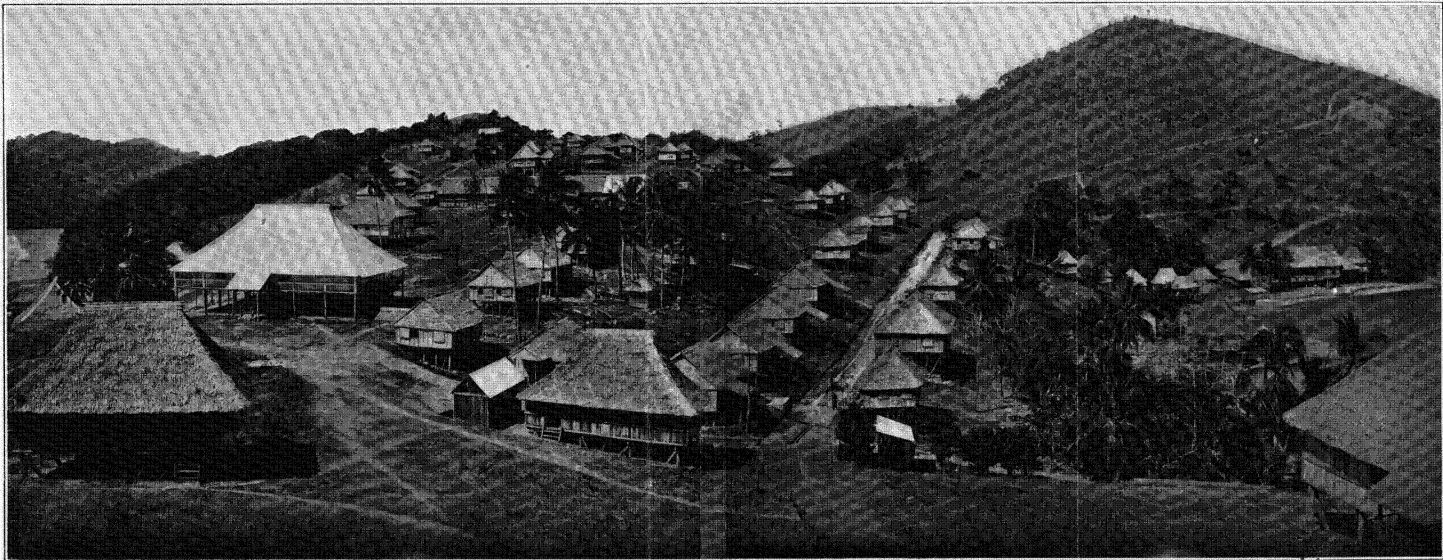
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CULION LEPER COLONY, LOOKING EAST.





CULION LEPER COLONY, LOOKING TOWARD THE SOUTH.

attempting to combat epidemics with conditions as above described, the draft of an act was prepared and submitted to the honorable the secretary of the interior, the essential points of which follow:

1. A reimbursible appropriation, to be known as the "municipal water-supply fund," is created in the insular treasury.

2. Upon application from a town, a representative from the bureau of public works and the bureau of health proceeds to the town, and in conjunction with the town council establishes the boundaries of a water district, all within the district, to be furnished with water from the contemplated system. The form of system, whether from a mountain stream with uninhabited water shed, artesian or driven wells, is then decided upon, and plans and estimates drawn up.

3. The council then passes an ordinance fixing a special per capita tax, not to exceed ₱3 per annum.

4. The plans, estimates, rate of taxation, etc., are then put to vote, the voters being those persons who live in the water district—any one who pays any form of tax whatsoever being liable to the water tax and eligible to vote.

5. If the election results in favor of the system, the insular government then proceeds to install the system, by contract, or through the bureau of public works. If no water is obtained, and the system results in a failure, no charge is made to the town. If it is successful, the town collects the tax mentioned above, depositing into the insular treasury to the credit of the "municipal water supply fund" until the contract price, plus 10 per cent—the extra 10 per cent being a guaranty to the government against loss in case of failure at other places to cover deficiencies in estimates, etc.—and is in reality similar to a premium paid a fire or life insurance company.

The above plan has been presented to a number of towns in the islands, and all consulted have stated that if the measure becomes a law that they would avail themselves of the advantages at once, as otherwise it would be many years before they could hope to have good water.

The tax of 25 centavos per month was considered very small, particularly when at most places the minimum paid at present to have a very inferior grade of water carried to their houses is ₱1.50 to ₱2 per month, and in some places costs as much as ₱8 to ₱10 per month. Many persons keep a servant whose whole work is to carry water.

In addition, the water tax is not collected until the need for paying for water no longer exists.

With a view to giving those persons who travel by water an opportunity to have proper drinking water while en route, the question of installing a small distilling apparatus that could be operated at a small cost on all inter-island vessels has received considerable attention. One distilling machine was designed, and later constructed at the shops of the bureau of navigation. The apparatus was satisfactory in every way, but it was rather heavy, and it was therefore deemed advisable to make further attempts to attain the same results by using lighter materials. This matter is now receiving attention. The distilling apparatus that was designed could be installed complete with a total cost of about ₱130 (\$65 United States currency).

It was the intention to use the boiler steam, thus making its operation a very inexpensive matter. The importance of having proper drinking water on board ship can not be overestimated. Persons who are habitually careful about their drinking water frequently find themselves on board ship for a trip of several days with nothing to drink but the ordinary city tap water, which is manifestly unsafe, but, there being no other available, they are almost compelled to use it.

EXPENDITURES.

At the close of the last fiscal year all unexpended balances reverted to the treasury, in amount ₱3,566.96. The amount received from all sources in the fiscal year 1906, including appropriations and refunds, amounted to ₱991,750.

The total expenditures authorized during the same period were ₱844,409.02, leaving a balance at the end of this fiscal year of ₱147,340.98, which will revert to the treasury.

These amounts are perhaps not absolutely accurate, because the exact amount of the bills contracted for during the latter part of the fiscal year is not yet known.

Detailed financial statement will be found in the appendix.^a

NOTE.—The figures shown above for expenditures include ₱10,000 authorized to be expended from any available balance of funds for the construction of a gravity water system at the Culion leper colony.

Very respectfully,

VICTOR G. HEISER,

*Passed Assistant Surgeon, United States Public Health
and Marine-Hospital Service, Director of Health.*

To the SECRETARY OF THE INTERIOR,
Manila, P. I.

^a Appendix containing statistical tables, bureau of health, accompanies this report and is on file in the War Department, where it may be consulted.

APPENDIX B.

REPORT OF THE CHIEF QUARANTINE OFFICER.

UNITED STATES TREASURY DEPARTMENT,
PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
OFFICE OF THE CHIEF QUARANTINE OFFICER FOR THE PHILIPPINE ISLANDS,
Manila, P. I., August 6, 1906.

SIR: In accordance with the instructions contained in Executive order No. 33, series of 1906, government of the Philippine Islands, I have the honor to submit the following report of the transactions of the bureau of quarantine service for the Philippine Islands for the fiscal year ended June 30, 1906:

The question, above all others, which has engaged the best efforts of the quarantine service during almost the entire year has been to prevent the spread of cholera from Manila by sea to other ports and islands in the Philippines, and to the United States and its possessions. The amount of time and labor involved in this task can scarcely be adequately set down on paper, nor can the matter be appreciated by those who did not actually take part in the work.

From the outbreak of cholera in Manila, August 23, 1905, to the close of the fiscal year, not a single case of the disease was carried by vessel to any point outside of Manila Bay. Cases were frequently encountered upon vessels during the time they were undergoing their outgoing quarantine detention, but with the facilities of the Mariveles quarantine station available, it was always possible to make the disinfection so thorough that no spread from the original case took place.

The large amount of experience which the service has had with cholera in the Philippines justifies the statement that the incubation period is seldom, if ever, beyond forty-eight hours, and with the exception of the first few weeks of the outbreak the detention placed upon outgoing vessels has, in most instances, not been beyond forty-eight hours.

The great aid that this shortened quarantine period was to the interisland shipping interests will be appreciated when the great business depression under which the islands are now laboring is taken into consideration. But the important point, however, is that not only was it possible to reduce the delay and annoyance to commerce to very small proportions, but also for the first time in the history of outgoing quarantine detention in the Philippines has the same been entirely effective. The fact that the disease was kept from sweeping through the southern islands means the saving of an incalculable number of human lives and many thousands of dollars. In other words, the quarantine service was able to render that aid which is called for in the fulfillment of its highest ideals.

PERSONNEL.

Passed Asst. Surg. Victor G. Heiser, chief quarantine officer for the Philippine Islands.

Manila.—Passed Asst. Surg. Victor G. Heiser, in command; Passed Asst. Surg. John D. Long; Asst. Surgs. R. E. Ebersole and Herbert M. Manning; chief clerk and disbursing officer, N. C. Comfort.

Mariveles.—Passed Asst. Surg. Charles W. Vogel.

Iloilo.—Asst. Surg. R. H. Creel.

Cebu.—Passed Asst. Surg. Carroll Fox; Pharmacist Charles R. McBride.

Zamboanga.—Acting Asst. Surg. H. F. Pipes.

Jolo.—Acting Asst. Surg. Charles B. Ewing.

Cavite.—Acting Asst. Surg. A. R. Alfred.

Olongapo.—Acting Asst. Surg. E. J. Grow.

Seventy-two more persons are employed in the service, who perform the duties of clerks, disinfectors, vaccinators, crews, attendants, etc. Total personnel, 84.

MANILA OFFICE.

At the time the general reorganization of the Philippine government was being undertaken last October, it was proposed to make the quarantine service a division of the bureau of health; in fact, the bill had already passed two readings before the Commission. The plan, however, was deemed very undesirable, in that it took away much of the independent character of the service, and much of its prestige would have been lost in dealing, particularly, with foreign countries. Upon full explanation being made to the Commission the plan was abandoned, and the service in the Philippines still occupies the position of an independent bureau under the insular government.

CHOLERA.

From March 8, 1904, until August 23, 1905, no cases of cholera are known to have occurred in the Philippines. From time to time during this latter period suspicious cases which clinically resembled Asiatic cholera came to the attention of the insular board of health, but the diagnosis could not be confirmed bacteriologically. For the two weeks immediately preceding August 23 the number of suspicious cases increased. In Manila one occurred in San Pedro Macati, a suburb of Manila; one in a bakery in Paco; one in the San Miguel district; one case was that of a soldier in the Cuartel de España, and several others occurred in the province of Rizal. The cases in Manila were all carefully autopsied and the intestinal contents bacteriologically examined by such competent observers as Dr. R. P. Strong, of the government laboratory, and his assistants; and the case of the soldier was carefully investigated by the military medical authorities and specimens examined at the army laboratory, which is maintained in connection with the First Reserve Hospital in Manila. From both of these independent sources the results were reported as negative.

On August 23, while Passed Asst. Surg. John D. Long, of this service, was making autopsies at Bilbid prison, he found a case which presented a typical pathological picture of cholera. The bacteriological examination which was made later at the government laboratory revealed the cholera spirillum of Koch. Thus occurred the first officially recognized case of cholera of the present outbreak—a case in an institution which is practically cut off from the remainder of the world, where all the food-stuffs are permitted to enter only after the most rigid inspection, and where all food served that would be likely to convey cholera is cooked at all times. As a precaution against dysentery, it is said that all drinking water was sterilized; therefore, it would seem that the routine precautions taken at the prison should have afforded protection against cholera. The commencement of an outbreak in this insidious manner was most puzzling to the sanitary authorities, and the prospects of combating a disease whose origin was so obscure were not encouraging. On the following day six cases suspicious of cholera were reported by Major Wales from Fort William McKinley, which is located about 7 miles up the Pasig River from Manila. For the week preceding August 23 about eight cases with profuse diarrhea and vomiting, followed by collapse, had occurred at the fort. The symptoms were the same as those usually found in vino poisoning, which is so common among the United States soldiers in the islands, and in the absence of any cholera being reported anywhere in the Philippines, there was no particular reason for investigating the cases further. In view of the fact, however, that the diagnoses of some of the later cases that occurred at the fort were bacteriologically confirmed, the earlier diagnosis of vino poisoning may not have been correct. The military medical men at once commenced active measures, and the comparatively few days that cholera persisted at the fort is another excellent example of how readily the disease can be eradicated when sanitary principles are intelligently applied.

On August 25 an American woman residing at the Grand Hotel, in the walled city, was attacked and died in a few hours. On the same day an American man residing on San Sebastian street, in a section of the city nearly 2 miles from the previous case, was seized and died a few hours afterwards. No connection could be traced between the two cases, nor could any history be obtained that the same article of food which would be likely to convey the infection had been eaten by these two victims.

The characteristic tendency of the outbreak continued during the early weeks of the scourge, namely, no connection could be traced between the cases. No two cases occurred in any one house, nor did two cases occur in any one group

of houses. A study of a map prepared showing the order in which cholera cases occurred in the city of Manila shows clearly that succeeding cases apparently had no connection with one another. In almost every instance they occurred in widely separated sections of the city.

In the meantime a telegram received August 26 from Jalajala, province of Rizal, through the army medical department, contained the following information:

"Cases of a disease resembling cholera have developed in Jalajala, the first case being registered on the 21st. From that date to the 25th 16 cases and 12 deaths have been registered, the illness lasting from twelve to twenty-four hours."

On August 26 another telegram, received from the president of the provincial board of health at Pasig, reported one suspicious case followed by death in that town. A representative from the insular board of health and another from the bureau of government laboratories proceeded at once by special launch to Pasig and Jalajala for the purpose of making an investigation as to the cause of the outbreak in those places. The result of this investigation did not shed any light upon the origin of the infection. Inquiry made by the inspectors only resulted in showing that at least one week prior to August 23 more deaths had occurred in Jalajala than usual, and that the victims had profuse diarrhea and died a few hours after the symptoms manifested themselves.

An investigation made by Dr. L. T. Hess, captain and assistant surgeon, United States Army, of the records on file at Muntinlupa and Biñan, situated in Rizal and Laguna provinces, respectively, and on the opposite shore of Lake Laguna from Jalajala, showed that a number of death certificates had been filed during the week preceding, the cause of death being given as suspicious diarrhea.

In the following table is given the death rate per thousand in Manila for the years 1903 and 1904, in which no cholera was reported. The death rate for the same months in 1905, during which 250 deaths from cholera are reported, is also given:

	1903.		1904.		1905.	
	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.	Number of deaths.	Annual death rate per 1,000.
August.....	862	46.17	1,082	55.28	841	45.03
September.....	1,228	67.97	1,064	58.89	1,013	56.06
October.....	1,217	65.19	1,018	54.53	850	45.61
November.....	974	58.91	957	52.97	944	52.24
December.....	894	47.89	794	42.53	841	45.03
Average.....	{ 281.13 56.22 }		{ 264.20 56.80 }		{ 243.87 48.77 }	

From the foregoing table it will be seen that the death rate for the years in which no cholera was reported was actually higher by more than 8 per thousand than in 1905, when cholera was reported.

The above showing is particularly important in view of the fact that an increase in the mortality has been almost universally accepted as being a strong factor in indicating that deaths from communicable diseases are occurring. Many epidemiologists who have written upon this subject in the past have laid special stress upon the fact that where it was difficult to obtain the actual cause of death an increase in the number of deaths should be regarded with suspicion.

It will now be interesting to consider whether the infection was introduced into the Philippines from without, or, in other words, from foreign countries, or whether it was merely a recrudescence of the disease known to have been present during 1902 and 1903. In order to discuss this subject intelligently it will be necessary to ascertain in what near-by foreign countries cholera was present at the time of the outbreak in the Philippines. Manila is in active communication, by direct steamship lines, with the following Oriental ports: Yokohama, Kobe, Nagasaki, Moji, Shanghai, Amoy, Hongkong, Saigon, Sing-

apore, Rangoon, Calcutta, Madras, Bombay, and, indirectly, with Sourabaya, and a few other Javanese and Bornean ports. Examination of the official sanitary statistics received from the ports mentioned discloses the fact that cholera was present in an isolated manner in the country to the back of Kobe, Japan, and in Calcutta and in Bombay. In the case of the two latter ports the sailing time to Manila by the most direct steamers is at least nine or ten days from Calcutta, and at least fifteen days from Bombay. In view of the fact that the incubation period is only five days, and that no sick were found on any of these vessels in the two months preceding the outbreak, and that from laboratory experience it has been ascertained that vegetables and other cargo which come from these ports will not serve as media for the growth of the cholera bacilli for a greater period than five days, it is shown that for practical purposes these two ports may be dismissed from further consideration. At any rate, the only importations from India are rice, onions, potatoes, textiles, ivory goods, and other articles not at all likely to convey cholera organisms.

No cholera was reported from Hongkong and none was known to exist at Canton, but, in view of the fact that the actual status of the public health in Canton is not well known at any time, that place can not be excluded with any degree of positiveness. The time from Canton to Manila by way of Hongkong would require at least from four to five days, but in view of the fact that only onions, potatoes, garlic, and such other vegetables were shipped from these ports, which are necessarily forwarded in a dry state, it is not likely that the cholera organism could have been introduced with them. Furthermore, no sick were found on any of the vessels which entered the Philippines from Hongkong, so that it is reasonable to exclude that port from the list of places likely to have been the cause of the introduction of the infection.

The records show that from Kobe a number of vegetables were shipped, but they consisted principally of onions and potatoes and a very small amount of cabbage. The vessels that arrived from that port during the month preceding the outbreak of cholera in Manila did not have any cases on board which were in any way suspicious of cholera. In view of the fact that cabbage is the only vegetable which could likely have been the cause of the introduction of cholera, and since at least five days is consumed in the voyage, and more time must necessarily have elapsed before it could have been placed on the market, and since experiments made in the laboratory of the Public Health and Marine-Hospital Service show conclusively that cholera organisms can not be kept alive on cabbage for longer than five days, this method of the introduction of the infection may also be excluded. The only other articles which are open to suspicion imported from Kobe, Japan, are classes of food peculiar to the Japanese and which are not eaten by other nationalities. Many of them consist of vegetables in a fermented state, which in itself precludes the possibility of cholera organisms existing therein, and, furthermore, no Japanese are known to have been attacked in the city of Manila until the disease was present at least five days and after more than 25 cases had occurred in other nationalities. It is, therefore, not likely that the infection can be ascribed to Japanese food products.

From the foregoing it will be observed then, that, so far as it is possible to tell from the records, it is not likely that the infection gained entrance into the Philippine Islands from without. This is further strengthened by the fact that the first known case occurred in the interior of the Philippines and not at any seaport, and the evidence is clear that the disease spread to Manila from the interior by the ordinary roads of travel. While there is not sufficient evidence to form a positive conclusion, still the facts in our possession at the present time strongly indicate that the infection which was introduced in 1902 has not yet been entirely eradicated. Against the supposition that the disease is endemic in the Philippine Islands is the evidence that, while the disease occurred throughout the Philippine Islands in 1902 and 1903, yet during the recent outbreak it has been confined to within a radius of 75 miles of Manila, and if cholera is epidemic in the Philippines, as claimed by many, it is difficult to explain the nonappearance of the disease outside of the limits mentioned above.

(The exact measures which were taken with regard to the management of the maritime quarantine are more fully set forth in the circular letters which are appended to this report.)^a

^a These circular letters are on file in the War Department.

PLAGUE.

During the year there has been less plague in the islands than at any time since the American occupation, 22 cases and 18 deaths being reported for the year.

During March infected rats were found in a number of sections of the city, being the first time they had been detected for over a year, and an outbreak of plague among human beings was more or less expected from this fact, especially in view of the statements made by Professors Kitasato and Shiga, of Japan, that an outbreak of human plague can almost be predicted to occur with certainty within a period of sixty days from the time the first infected rats are found. It is, therefore, very satisfactory to report that even though ninety days have elapsed since infected rats were first noted, so far not a single case of human plague has occurred, and no plague rats have been found for a period of more than thirty days.

Upon the discovery of plague among rats the most active measures were taken by the bureau of health. A large force of rat catchers was employed, which operated all over the city, the idea being to ascertain the extent of the infection. Radiating lines were drawn from the infected center to the outskirts of the city, and rats caught in all sections of the city covered by the lines in question. It was soon learned that the infection among rats was confined to two centers, one in the district of Binondo, in the large block which is bounded by Calle Rosario and the Escolta, and another small block in the district of San Nicolas, in which much plague has been encountered heretofore. Large numbers of rat catchers were sent into these infected centers and, so far as possible, all rats were caught and destroyed. A thorough disinfection of this area was then commenced. Work was begun in the topmost story of all buildings. All goods were moved to make sure they harbored no rats, and everything, unless of entirely new nature, was thoroughly disinfected with bichloride solution. This work was continued story by story until the ground floor was reached, after which the entire premises surrounding the buildings were cleaned up. Wood piles were found to be favorite harboring places for rats. These were invariably torn down and replaced upon sites that had previously been made rat proof. All rats runs were destroyed, drains and open spaces connected with the buildings of the infected sections were thoroughly cemented, and other repairs made which seemed to be indicated. The work occupied almost two months' time, but so far the results that have been obtained have fully justified the outlay.

The freedom which the Philippines have enjoyed from plague can undoubtedly to a large extent be credited to the work of the service in preventing the introduction of fresh cases from the nearby foreign countries. This is particularly satisfactory when it is remembered that the number of cases of plague in Hongkong and Canton this year has been much greater than has occurred in previous years. With the excellent inspection service maintained along the China coast by officers of this service, supplemented by the work which is done on vessels upon their arrival here, it has been possible to keep the plague infection in thorough check. Under the head of "Vessels disinfected" there is given a brief history of the three vessels which arrived in the Philippines with plague aboard.

During the month of June a communication was received from the consul at Amoy, which was forwarded to Washington for action, in which it was requested that arrangements be made at Amoy for the preliminary disinfection of persons and cargoes bound for the Philippines, the same as is now done at Hongkong. The consul is particularly anxious to carry this matter through, because he claims it is a considerable disadvantage to have a quarantine of seven days placed upon arrivals from Amoy in the Philippines during a period of more than six months each year, and much of the business which should go direct from Amoy to the Philippines is diverted by way of Hongkong.

In conclusion, it may be stated that the experience of the service in the Philippines shows that the same measures which result in the eradication of rats, mice, and other vermin aboard vessels also prevent the transmission of plague. For this reason it has been deemed advisable, in order to prevent the spread of plague in the Philippines, to continue the fumigation with sulphur of all vessels engaged in the interisland trade, as well as those vessels bound for the United States.

SMALLPOX AND VACCINATION.

Six vessels arrived with smallpox on board; six cases came under observation, all of which were removed from vessels. No secondary cases developed at the quarantine stations among contacts held to complete the incubation period.

The crews of interisland vessels have now been so thoroughly vaccinated that it is very rare to find a case of smallpox upon interisland vessels, and when it does appear, it usually occurs in the person who had only recently accepted appointment, and had not yet been successfully vaccinated.

The service in the islands has vaccinated a grand total of 7,645 persons. Of these, there were 4,661 members of crews vaccinated at Manila, with 2,698 known "takes." At Iloilo there were 695 persons vaccinated, with 342 known "takes." At Cebu there were 1,502 vaccinations, with 635 known "takes." At Manila the proportion of "takes" was over 57 per cent.

The custom of vaccinating all members of crews who apply at the office of the chief quarantine officer, and before they take service on vessels, has been continued throughout the year, and, no doubt, much of the freedom from smallpox may be attributed to this measure.

LEPROSY.

Four cases of leprosy were detected on vessels during the year. Three vessels were disinfected by officers of the service on account of their carrying lepers on board. These vessels were engaged in collecting lepers throughout the islands and removing them to the Cullion leper colony.

VESSELS BOARDED.

During the year there were 3,266 incoming vessels boarded at Manila and 3,252 at the other ports of entry of the islands, a total of 6,518. This is a decrease of 101 at Manila and a decrease of 3,278 at the other ports, a total difference of 3,379 in favor of last year. The actual number of incoming vessels, however, is much greater than these numbers indicate, because many interisland vessels are exempted from inspection on arrival, for reasons given in previous annual reports. Incoming vessels are boarded from sunrise to sunset, and at Manila vessels arriving late in the day call at Mariveles for inspection and pratique, and thus add three hours to the actual time vessels are inspected upon arrival, making the inspection practically from sunrise to 9 p. m.

VESSELS DISINFECTED.

Fifty-nine incoming vessels were disinfected during the year. Of this number, 51 were disinfected at the Manila station, 5 at Iloilo, and 3 at Cebu. In addition to the above, there were 31 partial disinfections of vessels. Twenty-three vessels were disinfected on account of quarantinable diseases being found on board upon arrival, and 36 were disinfected on account of coming from infected ports. Six vessels were disinfected on account of cholera, 4 for leprosy, 6 for smallpox, and 3 for plague. From the foregoing it will be seen that there has been a decrease in the number of infected vessels. Last year there were 28 as against 23 for this year.

There were three very large vessels during the year infected with plague. It is very satisfactory to report that the facilities of the station proved entirely adequate to meet the demand. The steamship *China*, of the Pacific Mail Steamship Company, arrived at Manila with a case of plague on board in the person of a Chinese member of the crew. By the prompt measures that were taken no further spread occurred, and the cargo which was taken ashore gave rise to no further cases. The second case arrived at Cebu on the British ship *Banca*. The facilities of the new quarantine station were not yet entirely available, so that it was not possible to stamp out the disease with the same promptitude which obtained at Mariveles. In all, a total of two cases occurred, and when it is remembered that all the rats and cats on board were infected, it will be seen that the infection was widespread over the vessel. The last case occurred on the *Kumano Maru*, a Japanese vessel, which plies between Japan and Australia and only makes this a port of call. The case occurred in the person of a steerage passenger who was bound for Manila.

VESSELS FUMIGATED.

One hundred and forty-three vessels were fumigated with sulphur for the purpose of killing rats and other vermin. This work takes a great deal of time, labor, and careful official supervision. This work during the year has been performed quite satisfactorily. No claims for damages of any kind have been made, and not one letter of complaint been received, which, while praiseworthy of the manner in which the work was performed, emphasizes the desirability of conducting this important work under the direct supervision of trained officials.

The number of vessels fumigated has dropped off considerably from the number reported last year. This is not because there were actually less vessels fumigated, but on account of arrangements having been completed at Hong-kong, whereby many of the vessels are now fumigated at that port under the direction of Passed Asst. Surg. M. J. White, instead of in the Philippines, as heretofore.

CARGO.

The same rules and regulations which were mentioned in the last annual report, with regard to the importation of cargo, remained in force throughout the year, and, so far as could be observed, no particular hardships were created by their enforcement. Permitting vegetables that are forwarded in a dry state, such as onions, potatoes, and garlic, to come into the Philippines, provided they are accompanied by certificate showing they were not grown in infected districts, has proven satisfactory. The production of vegetables, like cabbage, lettuce, green onions, cauliflower, tomatoes, etc., has been so stimulated in the Philippines that the prohibition placed upon their entrance is very little felt at the present time.

OUTGOING QUARANTINE.

The regulation of the outgoing traffic between the Philippines and the United States still requires considerable time in its supervision. Twenty-one army transports, which carried steerage passengers, sailed for the United States during the year, making an average of about 700 persons on each transport who were bathed and disinfected at Mariveles quarantine station. One hundred and thirteen other vessels coming under the provisions of the United States quarantine laws and regulations were granted consular bills of health for United States ports. Twenty of these vessels were held in quarantine five days before sailing. Thirty-one vessels were partially or entirely disinfected and eight were fumigated throughout before the bills of health were issued. The crew and passengers of all vessels bound for United States ports were inspected on board prior to sailing.

During the year 31,806 pieces of baggage were disinfected and 30,305 inspected, making a total of 62,111 pieces of baggage, all of which were labeled in accordance with the regulations. In addition, there were certified 256,673 pieces of miscellaneous cargo before the same was loaded on vessels bound for United States ports. The inspecting and certifying of the above-mentioned cargo and baggage entails a vast amount of difficult and annoying office and outside work.

NONQUARANTINABLE DISEASES OCCURRING ON VESSELS.

The following nonquarantinable diseases were observed on arriving vessels: Appendicitis, 1 case; beri beri, 38; chicken pox, 4; diarrhea, 20; diphtheria, 1; dropsy, 1; dysentery, 28; heart disease, 5; malarial fever, 7; rheumatism, acute, 1; sprue, 1; tuberculosis, 15; typhoid fever, 1; wounds, severe, 12.

Beri beri continues to be one of the diseases most frequently observed among the very sick on arriving vessels. The service makes a practice of disinfecting the living quarters of vessels on which beri beri and tuberculosis are found upon arrival.

Mumps and measles are reported as having occurred during the voyage on many trans-Pacific army transports arriving at Manila. In view of the entire freedom of the islands from measles and typhoid fever, except a few imported cases, it is believed that these diseases, especially typhoid fever, should be placed upon the list of quarantinable diseases in the Philippine Islands.

AID TO OTHER SERVICES.

1. *Board on marine examinations.*—During the year there were 602 physical examinations made of masters, mates, engineers, pilots, and other ship's officers, in accordance with section 3 of act No. 780 of the Philippine Commission, which states, among other things, that the candidate for examination, or applicant for license, must be physically sound. These examinations are rigid and correspond in scope to those made of applicants for the Life Saving or Revenue Cutter services in the United States. There were 33 rejected and 38 provisionally passed.

2. *Immigration service.*—There were inspected 2,860 aliens; 23 were certified for rejection, and all so certified were deported by the immigration officers.

3. *Bureau of health.*—Vessels in port were disinfected on account of having diseases occur on board and permits issued for the discharge of special incoming interisland cargo, such as hides, lard, etc.

4. *Bureau of education.*—Eighty-five cadets of the nautical school (young men being educated at government expense to be officers on vessels) were physically examined; 10 were rejected and 3 passed provisionally.

5. *Bureau of navigation.*—Officers and sailors were examined to determine their physical fitness for promotion, for positions on the coast-guard vessels, as officers or cadets; candidates for the position of light-house keeper were also physically examined; water was furnished the vessels of the coast-guard fleet at Mariveles; cutters or launches were fumigated or disinfected when necessary.

6. *Coast and Geodetic Survey.*—One employee was physically examined at the request of the Bureau; one officer was examined in order to determine his physical fitness for promotion. A board of service officers was convened for the purpose of making recommendation as to the advisability of one of the Coast and Geodetic officers being transferred to the United States on account of his health.

7. *Bureau of posts.*—One employee was physically examined prior to promotion, at the request of the director of posts. The postal authorities were granted every facility and furnished an enormous amount of labor during the outgoing quarantine for the dispatch of the mails. A clerk from the Manila post-office was detailed for duty as an attaché of the Mariveles station to superintend the distribution of the arriving mail to the vessels in quarantine. As many as 200 sacks were handled on one day.

8. *Bureau of civil service.*—Special physical examinations were made, at the request of the director of civil service, of candidates whose physical status was doubtful. Ten per cent of those examined were rejected. Examination papers were also examined and marked whenever requested.

9. *Panama Canal Zone.*—Cargo, baggage, and household goods bound for the Zone were inspected and passed or disinfected and certificates with regard to same issued.

FLOATING EQUIPMENT.

The vessels of the service—four launches and two disinfecting barges—have been in commission all year, and have been kept in a high state of efficiency. The launches have been operated very successfully, and considerable hard service has been required of them.

No serious damage was suffered by any of the vessels of the service during the many severe typhoons of the past year.

Owing to the completion of the quarantine station at Cebu, the floating disinfecting barge *Proteccion* was removed from Cebu to Iloilo. The disinfecting barge at Iloilo is now in bad condition and requires a general overhauling, and it was intended to remove it to Manila in order to have this done, but the early onset of the typhoon season made it impossible to accomplish this, and the same will now have to wait until the end of the calendar year before it can be safely done.

INTERISLAND QUARANTINE.

Owing to the appearance of cholera in Manila, it has not been possible to dispense with the interisland quarantine at this port, but the number of vessels inspected at outports at the present time has been greatly decreased, so that the hindrance to commerce at the present time amounts to but very little. As soon as the conditions in Manila warrant, it is proposed to make further reduc-

tions in the number of vessels that will require inspection upon arrival at this place. No bills of health are required by interisland vessels at any port except Manila, and it is hoped when the cholera conditions improve that this requirement can also be again dispensed with. The circular letters outline in some detail the regulations which it was necessary to put into effect during the year.

CEBU QUARANTINE STATION.

On March 1, 1906, the Cebu quarantine station was formally opened. Since then it has been prepared to meet any calls that are likely to be made upon it. It is probably one of the most complete quarantine plants that exists in the world to-day. The experience and ideas obtained in the personal inspection of the leading quarantine stations throughout the world were incorporated in the station as far as practicable, and it is believed to embody the good features of all of them, with many of the undesirable features omitted. (A full description of the station was included in the last annual report.)

IMMIGRATION.

The medical examination of aliens arriving at the ports of entry of the Philippine Islands is made by the officers of the quarantine service. Tabulated reports are submitted herewith of the aliens who were detained at ports of entry in the Philippine Islands for the fiscal year ended June 30, 1906, on account of their falling within the medical provisions of the United States immigration laws and regulations.

The total number of arrivals for the year shows a distinct falling off from that of the previous year. The total number examined at ports of entry only amounts to 2,860, as against 3,460 for the year previous. Of this number, 2,272 arrived at Manila, which leaves 598 to be distributed among the remaining four ports of entry of the Philippines.

There were 19 persons certified at Manila, 3 at Iloilo, and 1 at Cebu, or a total of 23 for the entire islands. Of this number, 23 were actually deported, which gives an average of 100 per cent deported of the number certified.

These figures are probably better than those for any other port or set of ports at which the service inspects arriving aliens. The rejections are made up as follows: Trachoma, 21; syphilis, 1; pulmonary tuberculosis, 1.

From the foregoing it will be seen that the Philippines are particularly fortunate in the class of aliens who apply for admission. The rejections which were made all fall within the absolutely excludable classes.

The deported immigrants were made up by race as follows:

African-----	1	East Indian-----	8
Servian-----	1	Japanese-----	9
Chinese-----	3	Syrian-----	1

The percentage of rejections compared with the arrivals (2,860) amounts to 0.8 per cent, as against 7.1 per cent for last year. This very great reduction in the number of rejections, as compared with the figures for last year, is attributed, and it is believed justly so, to the instructions which the Marine-Hospital Bureau authorized the undersigned to impart to the officers of the service who are stationed at the China and Japan ports. They are now in better position to advise intending aliens who are bound for the Philippines with regard to their physical condition. It will also be interesting to observe as to whether a similar reduction has taken place in the percentage of rejections among the aliens who applied for admission during the past year at the Pacific coast ports of the United States.

The very anomalous condition of affairs with regard to arriving Chinamen still pertains. Chinamen who arrive at the port of Iloilo, in accordance with the ruling of the chief immigration officer at that port, who happens to be the collector of customs, are regarded as aliens, pure and simple, and a regular physical examination is made of them in accordance with the United States immigration laws and regulations, while Chinamen who arrive at the other ports of entry are not regarded as aliens by the chief immigration officers at the different ports, hence no physical examination is made of them. With this lack of uniformity at ports of entry, it is not very difficult to foresee that if

the present practice continues it will not be very long before no Chinamen will apply for admission at the ports where the physical examination is required.

There has been no improvement made during the year in the facilities at the disposal of the medical officers who make physical examinations of arriving aliens. All of this work is still being done upon the decks of the vessels which bring the immigrants. But in view of the constantly diminishing number from year to year, it has not been deemed advisable to insist upon better facilities.

In addition to the number of aliens already mentioned as being deported from the Philippines there were two aliens deported during the year on account of insanity. These cases were detected after they had been residing in the Philippines for some months. The opportunities for detecting insane soon after they land are so excellent that no particular effort is made to detect this class of cases at the time of arrival. The opportunities for medical officers' certificates being discredited for this class of cases are so many, and since the insane are almost certain to come under observation within two years after landing, the interests of the government are equally well served by taking care of the cases as they arise.

EXPENDITURES.^a

At the close of the financial transactions for the last fiscal year all unexpended balances, with the exception of the no-fiscal-year appropriation, reverted to the treasury, in amount ₱14,735.50. The appropriation available for expenditure during this fiscal year, including refunds, amounted to ₱175,757.90. The actual expenditures authorized amount to ₱163,432.48, leaving a balance of ₱12,325.42 at the end of the year. These amounts are not absolutely accurate, because the bills for supplies ordered during the latter part of the fiscal year can not be completed until the delivery of the articles and the exact cost of transportation is ascertained.

These authorized expenses include not only the general expenses of operating the service, but also the amounts spent or authorized for repairs and improvements.

ILOILO.

During the year a number of persons residing in or near Iloilo having symptoms resembling those of cholera were examined, but in each case the subsequent history showed that the diagnosis should probably have been ptomaine poisoning.

On September 4, 1905, the chartered transport *Elcano* arrived from Manila with a case on board in the person of a soldier, who was believed to be, by the army surgeons who saw him and the quarantine officer, suffering from cholera. The case was isolated, the necessary disinfection was done, and the vessel placed in quarantine.

The most rigid precautions are still taken at Iloilo with vessels which come from Manila and other plague-infected ports to guard against the introduction of plague, rat funnels being required on the ropes of all the vessels which come alongside the wharves of the river and of the bay. So far no cases of this disease have occurred at this port.

Smallpox was detected on two arriving steamers during the year. The smallpox patients were removed and isolated, the personnel of the vessels were bathed and their effects disinfected, and all persons vaccinated. Vessels were given the necessary disinfection. No secondary cases developed from either of these two ships.

All the other data with regard to Iloilo which it was deemed advisable to report will be found in the statistical tables.

CEBU.

Four cases of plague were reported in the port of Cebu, but all of them occurred in persons who had been residing there for at least several weeks prior to their infection; consequently it was quite certain that they contracted the disease from the infection which was introduced some years ago.

One vessel arrived at Cebu that had plague on board, but the prompt measures which were taken prevented the infection being conveyed ashore.

^a Detailed financial statement submitted on file in the War Department.

To the thorough vaccination which has been carried on during the past year in the province of Cebu in all probability may be attributed to the fact that no cases of smallpox were found upon vessels this year.

In order to prevent plague-infected rats, mice, and other vermin from being carried from Cebu to the other ports, outgoing vessels were carefully fumigated.

Since the opening of the new quarantine station, March 1, 1906, the office has been transferred to Cautit Island. On account of bills of health being issued only to foreign vessels, and arrangements with regard thereto being made at the time that they enter the port, the shipping interests were not inconvenienced by the change. In addition, a telephone has been installed, over which much business can be transacted.

An artesian well was drilled to a depth of 270 feet, where an abundant supply of water was found. The water is quite serviceable for many quarantine operations, but is not good for drinking or boilers, as will be seen from the following copy of the results of the chemical analysis.

DEPARTMENT OF THE INTERIOR,
CHEMICAL LABORATORY, BUREAU OF SCIENCE,
Manila, April 5, 1906.

ANALYSIS OF ONE SAMPLE OF WATER FROM THE ARTESIAN WELL AT CAUIT ISLAND,
CEBU (QUARANTINE STATION).

Physical: Colorless, transparent, little sediment, no odor.

	Parts per million.
Total residue	2, 583. 00
Volatile matter	68. 00
Mineral residue	2, 515. 80
Nonscale-forming ingredients	134. 40
SiO ₂	27. 00
Al ₂ O ₃ Fe ₂ O ₃	10. 80
CaO	53. 80
MgO	29. 20
SO ₃	2. 74
Oxygen consumed	5. 02
Chlorine	1, 110. 80
Albuminoid ammonia .....	. 07
Nitrites	None.
Nitrates	None.

NOTE.—This sample of water was taken when the water was first struck and before the well was deepened or cleaned out properly. It is therefore not a fair test of the water's purity. Another analysis is being made at present, and the results should be much more satisfactory.

ZAMBOANGA.^a

The quarantine inspection of vessels arriving at the port of Zamboanga is conducted by an acting assistant surgeon of this service. An inspection service only is maintained. The service during the entire year up to May 31, 1906, was in charge of Acting Asst. Surg. M. A. W. Shockley. He was succeeded on June 1, 1906, by Acting Asst. Surg. Henry F. Pipes.

During the year 31 vessels which arrived at Zamboanga direct from foreign ports were inspected. In addition, owing to the presence of cholera in Manila, all vessels from Manila were inspected upon arrival. No quarantinable diseases were detected upon arriving vessels during the year.

Immigrants to the number of 136 arrived at the port during the year and were inspected in accordance with the immigration laws. No diseases requiring certification were detected.

Zamboanga is the headquarters of the Department of Mindanao of the United States Army, and the city and vicinity are practically under the supervision of the army officials.

The sanitary condition of the city and neighborhood continues good.

^aThe tabulated statistics accompanying this report are on file in the War Department.

PORT OF JOLO.^a

At the entry port of Jolo, which is the principal port of the Sulu group of islands, the service maintains an inspection station only.

From July 1, 1905, to November 5, 1905, the station was under the command of Acting Asst. Surg. William F. Lewis. From November 6, 1905, until January 3, 1906, Acting Asst. Surg. Craig R. Snyder acted as quarantine officer of the port. On January 4, 1906, the command of the service was assumed by Acting Asst. Surg. Charles B. Ewing, who is in charge at the close of the year.

Twenty-five vessels direct from foreign ports arrived at Jolo during the year. No quarantinable diseases were detected upon arriving vessels. The arriving immigrants were inspected. Out of the 37 immigrants bound for Jolo none were found to be afflicted with diseases which call for certification by the immigration laws.

The sanitary conditions of the city of Jolo and the surrounding territory, as regards quarantinable diseases, has remained very satisfactory during the entire year.

CAVITE AND OLONGAPO.^b

At Cavite and Olongapo are located the United States naval stations in the Philippines. At these ports inspection stations under the direction of the service are maintained. The officers in charge are surgeons of the United States Navy, detailed as quarantine officers by the chief medical officer of the Asiatic fleet. In quarantine matters they are under the control of the chief quarantine officer.

Vessels of the Navy of all kinds arrive at the Cavite and Olongapo naval stations direct from foreign ports, and are inspected and treated in accordance with the regulations. No infected vessels arrived during the year. Ships in port having quarantinable or other diseases occur on board were remanded to Mariveles for disinfection. The battle ship *Ohio* had a case of smallpox occur on board, and was remanded from Cavite to the Mariveles station, where the vessel was fumigated and disinfected.

Thirty-three vessels arrived from foreign ports during the year.

Grand summary of the quarantine transactions in the Philippine Islands, by the U. S. Public Health and Marine-Hospital Service, during the year ended June 30, 1906.

Total number of vessels inspected	9,859
Total number of vessels detained in quarantine	1,403
Total number of vessels disinfected	85
Total number of vessels fumigated to kill vermin	131
Total number of bills of health issued	3,172
Total number of pieces of baggage disinfected	44,456
Total number of pieces of baggage inspected and passed	30,507
Total number pieces of miscellaneous cargo certified	346,773
Total number of cases of quarantinable diseases detected on vessels:	
Cholera	6
Suspected cholera	4
Plague	4
Leprosy	4
Smallpox	6
Total number of persons detained in quarantine	79,230
Total number of crew inspected	321,343
Total number of passengers inspected	180,811
Total number of persons vaccinated	8,145
Total number of persons bathed and effects disinfected	20,524

Respectfully submitted.

VICTOR G. HEISER,
Passed Assistant Surgeon,
Chief Quarantine Officer for the Philippine Islands.

To the SECRETARY OF THE INTERIOR,
Manila, P. I.

^a Tabulated statistics submitted are on file in the War Department.

^b Circular letters issued during the fiscal year, tabulated statistics, and a financial statement accompany this report and are on file in the War Department.

APPENDIX C.

REPORT OF THE DIRECTOR OF FORESTRY.

MANILA, P. I., *June 30, 1906.*

SIR: I have the honor to submit herewith report of the work of the bureau of forestry for the period from July 1, 1905, to June 30, 1906.

The work of the bureau during the past year, for the first time since its organization in 1900, has been devoted almost entirely to practical forestry. In 1900 the bureau was obliged to provide a plan for the appraisal and collection of charges on forest products. This feature of our work had grown to such proportions that the greater part of the time of our employees was devoted to it, and left but little time for work in the forest. Act No. 1407, dated October 26, 1905, reorganizing the bureaus of the Philippine government, relieved the bureau of this work and placed it where the equipment and personnel was much more suitable. The provision of the act above referred to is as follows:

"The functions heretofore performed by the employees of the bureau of forestry and by presidents of municipalities or settlements in measuring and manifesting timber or other forest products, stone or earth, taken from the public forests, in affixing the government charges to be paid thereon and in collecting delinquent taxes thereon, shall be discharged hereafter by employees of the bureau of internal revenue, under such rules and regulations as the director of internal revenue may prescribe and the secretary of finance and justice approve."

In accordance with the above provision the bureau of internal revenue took charge of the work prescribed on November 1, 1905, and the employees of this bureau assisted the internal-revenue officials for almost two months in taking over the work.

The division of inspection of this bureau, formerly charged with the above-mentioned duties, was thereby rendered unnecessary. Eleven employees of this division were transferred to the bureau of internal revenue. Fifty-nine forest officers and 4 other employees were given one month's notice to seek other positions. Many of these men were appointed deputies to provincial treasurers and municipal treasurers. The assistant foresters and rangers retained were men found to be particularly active and efficient in field work.

Fifty-six forest stations were maintained by this bureau throughout the archipelago at the time of last year's report. Of this number 30 were no longer considered necessary and were abandoned.

On November 10, 1905, upon request of the undersigned, the nurseries on the Lamao forest reserve, in the province of Bataan, were transferred to the bureau of agriculture.

On July 1, 1905, there were present for duty 3 foresters. Two foresters were absent on leave. An examination had recently been held in the United States to fill vacancies in this position in our service. As a result of this examination 4 foresters were appointed. Two foresters were transferred from the United States Forest Service and one forester returned from leave of absence, making a total of 10 foresters available for duty in November, 1905.

The archipelago was divided into 10 forest districts, with a forester in charge of each district. This enabled the bureau, for the first time, to supervise the work of important licensees in every province. The forest districts above mentioned are as follows:

Forest District No. 1.—Headquarters: Manila. Provinces: Laguna, Rizal, Cavite, Bataan, Bulacan, Pampanga, and Southern Zambales, south of Iba. Stations: Orani, Moron, Subic, and Angat.

Forest District No. 2.—Headquarters: Dagupan, Pangasinan. Provinces: Tarlac, Nueva Ecija, Pangasinan, Northern Zambales, north of and including Iba, Benguet, Nueva Vizcaya and Northern Tayabas (Baler and Casigaran). Stations: Dagupan, Cabanatuan, and Baguio.

Forest District No. 3.—Headquarters: Aparri, Cagayan. Provinces: Cagayan, Isabela, Ilocos Norte, Ilocos Sur, Lepanto-Bontoc, and Union. Stations: Aparri and Vigan.

Forest District No. 4.—Headquarters: Atimonan, Tayabas. Provinces: Tayabas, excepting northern part (Baler and Casiguran), and Camarines. Stations: Antimonan, Calauag, Unisan, Laguimanoc, and Nueva Caceras.

NOTE.—Forest District No. 6, the Camarines and part of Tayabas, has been added to Forest District No. 4.

Forest District No. 5.—Headquarters: Calapan, Mindoro. Provinces: Mindoro, Batangas, and Romblon. Stations: Calapan and Bongabon.

Forest District No. 7.—Headquarters: Sorsogon, Sorsogon. Provinces: Albay, Sorsogon. Stations: Legaspi, Sorsogon, and Masbate.

Forest District No. 8.—Headquarters: Iloilo, Iloilo. Provinces: Negros Occidental, Negros Oriental, Iloilo, Capiz, Antique, Cebu, Bohol, Leyte, and Samar. Stations: Cadiz Nuevo, Bacolod, Iloilo, Cebu, Capiz, and Tacloban.

Forest District No. 9.—Headquarters: Zamboanga, Moro. Provinces: Moro, Misamis, and Surigao. Station: Zamboanga.

Forest District No. 10.—Headquarters: Manila. Province: Palawan. Station: Puerta Princesa.

During December, 1905, the foresters were ordered to take charge of their districts. A set of instructions was furnished each one. These instructions provided for the inauguration of the following work: Map of the district; study of forest resources; location and inspection of cutting areas; data for a preliminary working plan for one concession in each district; official reports and other correspondence; licenses; inspection of agricultural character of land desired to be taken as homesteads, for purchase or lease; registration and inspection of private woodlands to be exploited for the market; *cañging* or clearing permits; collection of data, giving cost of gathering forest products, transportation, and labor; investigating future fields for forest exploitations, etc.

During the second half of the fiscal year 1904-5 detailed examinations were made of the forest tracts of the concessions of the Mindoro Lumber and Logging Company on the east coast of Mindoro, and of the Insular Lumber Company, in the northern part of Negros. Both of these companies have twenty-year license agreements. The object of these examinations was to collect data preparatory to forming preliminary working plans for the tracts.

The personnel of the Mindoro party consisted of one forester, two assistant foresters, two rangers, and native helpers. That of the Negros party consisted of two foresters, one assistant forester, three rangers, and native helpers.

On both islands data were collected for topographical and forest maps, valuation surveys run, botanical specimens collected, reproduction studies made, and logging possibilities noted.

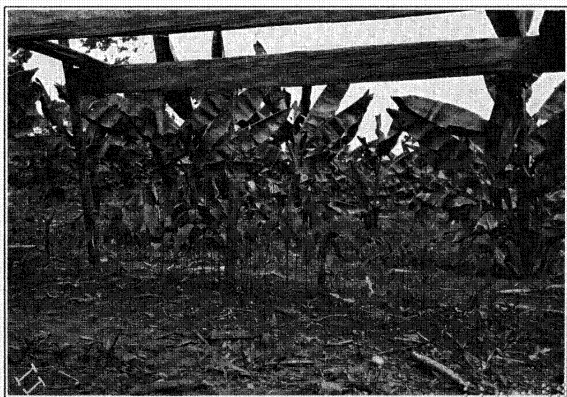
The Mindoro concession includes the forests on a low coastal plain near the Bongabon River, and is on typical agricultural land. In consequence of this about half of the original forest has been removed. The areas on forested and deforested lands will be placed on the map, and from data collected from the valuation surveys the character and amount of merchantable timber will be determined. This tract contains about 70 square miles, about one-half of which is cleared land. In making the valuation surveys seven commercial tree species were counted. These seven species represent more than one-half of the total stand of timber on the tract. The stand of valuable merchantable timber on the forested portion of the tract is large. A portion of the tract, containing 3,500 acres, has standing on it more than four million feet, board measure, of Narra above 16 inches in diameter. This represents but 8 per cent of the stand of commercial timber on this small tract.

The Negros concession lies back of the sugar lands, at the foot of Mount Silay, near Cadiz Nuevo, and, in contrast to the Mindoro concession, represents an entirely different type of forest. Ninety per cent of the tract, comprising a total area of 69 square miles, is in heavy timber of the third and fourth group species. In making the valuation surveys six merchantable tree species were counted, which represented 89.3 per cent of the total stand of timber on the tract. In estimating the stand of merchantable timber, trees of 16 inches and more in diameter were counted. On the forested area of this tract were found approximately 35,000 feet, board measure, of merchantable timber per acre. The manufactured lumber from the species above noted finds a ready market in the Philippines at good prices. Adjoining this concession are at least 200 square miles of public forest, containing approximately the same class and stand of timber.

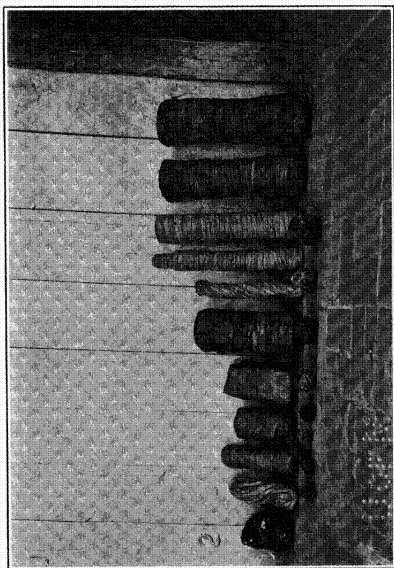


NARRA (*PTEROCARPUS INDICUS*).

Diameter 200 centimeters above buttress (3.8 m.); bole, 10 m. Place: Delta of Bongabon River, east coast of Mindoro.



PARA RUBBER SEEDLINGS, ISABELA, BASILAN.



DIFFERENT FORMS OF GUTTA-PERCHA IN COTABATO MARKET, MINDANAO.

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Both reports are being prepared for publication and will show graphically the commercial possibilities of lumbering on a large scale in the Philippines.

Besides the above, many of the foresters have started investigations along special lines. The forester in the Moro district is working on rubber and gutta-percha; the forester in charge of the Visayas is working on mangrove swamps and their products; in another district the forester is taking up the cañgin problem. One forester, who has had special training in mapping forested areas, has inaugurated a uniform system of mapping commercial and noncommercial forests and cultivated and uncultivated lands. The plan proposed has been adopted for all of the forest districts.

The study of the silvicultural habits of the principal Philippine timber trees has been a part of the regular work of the foresters since the establishment of the bureau. During this year some of the foresters have paid special attention to this important work and have gathered together some very valuable data. This information is being compiled for publication as part of a bulletin on the first ten timber trees, in the order of the amount received, in the Philippine market.

MAPS.

Reliable maps of the forest districts are deemed of the first importance. Forest officers are constantly adding information concerning the topography and forest areas of their districts. An assistant forester, who is also a good topographical engineer, has charge of field work, where accurate maps are desired, and also takes charge of compiling all topographical notes.

In this connection, the undersigned wishes to state that a vast amount of topographical information is being gathered by a number of different offices in these islands. The notes and maps from some of these offices are not published. The following offices, upon request, furnish much of such information: Coast and Geodetic Survey; chief engineer, Philippines division; military information division; bureau of lands; bureau of public works; Philippines constabulary, and the provincial governors and supervisors. The undersigned respectfully suggests that some arrangement be made for the compilation, revision, and publication of all such information.

FREE CUTTING.

Act No. 1407, reorganizing the bureaus of the Philippine government, contains the following:

Paragraph b, Sec. 9.—“For the period of five years from the date of the passage of this act, any resident of the Philippine Islands may cut or take, or hire cut or taken, for himself from the public forests, without license and free of charge, such timber, other than timber of the first group, and such firewood, resins, other forest products, and stone or earth, as he may require for house-building, fencing, boatbuilding, or other personal use of himself or his family. Timber thus cut without license shall not be sold nor shall it be exported from the province where cut.

“Dealers in forest products, stone or earth taken from the public forests shall pay the charges prescribed in Article XIV of act numbered eleven hundred and eighty-nine, entitled ‘The internal-revenue law of nineteen hundred and four’ on all such products taken by them. Every person, firm, or company whose business it is to sell timber or other forest products, stone or earth shall be regarded as a dealer in such products within the meaning of this act.”

This privilege has been a great boon to the people of the provinces. Wood is now used to a large extent in rebuilding the houses of the middle and poorer classes, where nipa, grass, and bamboo were formerly used.

Some difficulty is experienced by the forest officers in inspecting cuttings, as in many cases the work of the free cutters can not be distinguished from that of the regular timber licensees.

Within the jurisdiction of almost every town where timber licenses are granted are areas of woodland not covered by license. These latter areas could be given over to persons desiring free timber, under the above-mentioned law, the other areas to be operated over solely by licensees. Two timber licenses are not issued for the same area, so that this arrangement enables the forest officers to inspect and control properly the area covered by each license. The maps of each forest district show the territory covered by timber licenses,

making it a comparatively easy matter for forest officers to indicate to presidents and other municipal officials in each town where timber licenses have been granted and where free cutting might be permitted. If this suggestion is approved, a draft of an act carrying out the provisions of the same will be submitted to your office.

Act No. 1497, of May 26, 1906, granting to the Philippine Railway Company a concession to construct railways in certain islands, also grants them authority during construction to take timber from public forests free of government charges. Regulations governing the use of this privilege will be submitted in the near future.

CAIÑGINS OR FOREST CLEARINGS BY FIRE.

The practice of making clearings in the public forest continues unabated, and forest officers are deeply impressed by the fact that by far the most destructive agency in the Philippine forest is the making of caiñgins. The total destruction is beyond belief. It seems remarkable, when visiting the scene of a recent caiñgin, to find that such a few people with fire and a few tools can, in such a short space of time, cause such havoc in the virgin forest, where the trees are enormous and the humidity great. The undersigned was surprised when penetrating the belt of timber, 5 to 10 miles wide, fringing the east coast of Mindoro to find in the interior of that island so many and such large clearings.

Every forest officer has done his best to stop this practice. Imprisonment and fines fail to accomplish the desired results. Many of the provincial and municipal officials take but little interest in this matter. A campaign of education must be started, whereby the influential people of the provinces will be made to see the serious results that such a practice entails upon the natural resources of their provinces and be induced to unite with the foresters in an effort to check this practice. The Philippine Lumbermen's Association is desirous of assisting in this work. A recent letter from this association to this office is quoted below:

"MANILA, July 18, 1906.

"MR. GEORGE P. AHERN,

"Director Bureau of Forestry, Manila, P. I.

"SIR: The Philippine Lumbermen's Association is greatly obliged for the courtesy shown by you, as well as by the foresters of the bureau under your direction, in the meeting held on the 11th and 12th instants, in which the matter regarding restrictions of classes of timber and licenses has been decided upon with mutual approval of both bodies, but there is still something to do, and it is to solve the difficult question of caiñgins which is the purport of this petition.

"In the opinion of this association the caiñgin should be strictly prohibited, inasmuch as there is no lack in the islands of abandoned cogon lands and sites on which caiñgins have been made.

"At the present time the caiñgin is made in the center of the woods, where the lumberman has not penetrated, and it has been occasionally seen that the more he penetrates into the forest the less timber he finds.

"It is difficult to stop this long-continued practice in this country. In the cuttings the licensees may cooperate with your bureau by making the people understand the damage they cause themselves in destroying the woods.

"Although the caiñgins made for agricultural purposes bring a benefit to the country, the way in which they are being carried on at the present time represents the immediate destruction of the forests.

"This association believes that it may prevail to some extent upon the people to stop this destruction. A committee of wealthy and prominent persons will be elected in every town, under the presidency of the forester of the province, which committee should be authorized to grant caiñgins whenever the lands on which same are made are for the planting of permanent crops, such as hemp, coconuts, gums, etc. This committee should require the applicants to utilize the trees to be cleared, prohibiting the method of caiñgins actually used, by which the surrounding trees are killed, and it should be responsible for any violations in the forests.

"Trusting that the suggestion will meet your kind consideration, and thanking you in the name of the Philippine Lumbermen's Association, I remain,

"Very respectfully,

"R. AGUADO, *Secretary.*"

It seems to be the opinion of many interested in stopping this practice that the power to issue *cañgin* permits, now granted to municipal presidents, should be annulled, and that forest officers only be granted such privileges. This the undersigned believes would be a proper change, as far as the commercial forest is concerned, but he believes that the authority of the municipal president could be continued where permits are desired to make *cañgins* on woodlands or brush land, where the wood product is of secondary importance and where agriculture would be profitable.

The undersigned respectfully recommends that the present law be amended so that the municipal presidents be authorized to grant *cañgin* permits only on such areas in the municipality as may be indicated by the chief of the forest district, the present authority under the law to remain as it is until the above area where *cañgins* may be permitted by the president is so indicated. At the same time the forester will indicate the area where *cañgins* will be prohibited.

Notwithstanding the leniency of the *cañgin* law, many cases occur where, *cañgins* are made without authority, and this often happens in places where the law is well known and where large quantities of timber are destroyed. From March 25 to June 13, 1906, 128 such cases were reported to the fiscals of eight provinces, but these officials seem to take but little interest in the matter. Out of this number two have been acted upon by the fiscals and one was suspended by this office.

Beginning with the fiscal year 1904-5 card record by municipalities will be kept of persons desiring homesteads and those making *cañgins* with and without permits, thereby keeping a check on certain natives moving from place to place.

TIMBER-TESTING LABORATORY.

During the past year the investigation of marketable timber has been continued. Mechanical tests, including moisture determination, specific gravity determinations, cross-bending tests, tests in compression along the grain, and shear tests, have been made upon the following woods:

No.	Common name.	Specimens from province of—	Number of tests.
1	Lauan	Zambales	306
2	Apitong	do	279
3	Guijo	Mindoro	442
4	Molave	Camarines	233
5	Narra	Cagayan	269
6	Tanguile	Zambales	422
7	Sacat	Tarlac	468
8	Ipil	Mindoro-Palawan	767
9	Dungon	Masbate-Mindanao	738
10	Malasantol .....	.....	244
11	Supa	Tayabas	546
12	Balacat	Tarlac	604
13	Macaasin .....	.....	415
14	Calantas	Albay-Mindoro	325
15	Tindalo	Camarines-Masbate	415
16	Amuguis	Mindoro	110
17	Acle	Tarlac-Zambales	107
18	Betis	Camarines	278
19	Bansalaguin .....	.....	220
20	Batitinan .....	.....	36
21	Aranga	Camarines	431
22	Banuyo	Sorsogon	172
23	Balabacan	Negros Occidental	154
24	Mayapis	Laguna	180
25	Malugay	Mindoro	270
26	Sasalit	Zambales	349
27	Lumbayao	Basilan Island-Moro	477
28	California Redwood .....	.....	173
Total number of tests			9,460

The laboratory now possesses reliable information regarding the mechanical properties of 30 important woods, including those mentioned above and Yacal and Liusin.

In addition to the mechanical tests, especial attention has been given to the behavior of the woods in the dry kiln and in various processes of manufacture.

Timber is either on hand or has been ordered for making tests on Palo Maria,

Mangachapuy, Banaba, Agoho, and Bolongeta. Up to the present time these tests have been made upon woods bought in the Manila market. The bureau is now in a position to obtain these woods, with botanical specimens, directly from the provinces in which they are cut, and as rapidly as obtained tests will be made on botanically determined material.

In September, 1905, tests were started upon 13 samples of rope submitted by the bureau of agriculture, to determine the relative merits of Maguey and various grades of hand-cleaned and machine-cleaned Manila hemp. The tests included the determination of weight per hundred feet, strength, and percentage of elongation. These tests were of such interest that a series of tests was made upon the Manila hemp rope used in Manila. Thirty-three samples, varying in circumference from $\frac{3}{4}$ of an inch to $3\frac{1}{2}$ inches, were obtained from the following concerns:

Bureau of prisons, Manila; Ynchausti & Co., Manila; Laguna Rope Factory, Santa Cruz, Laguna; Hongkong Rope Manufacturing Company, Hongkong, China; Tubbs Cordage Company, San Francisco, Cal.; Plymouth Cordage Company, Plymouth, Mass.

The results show that rope manufactured in Hongkong and the United States is superior to that manufactured in these islands. This superiority is due partly to modern methods of manufacture and to the use of high-grade hemp.

Extract from report of notes taken on observations of Pacific Coast timbers planted at Linao, Bataan, with the view of determining their resistance against attack of anay (white ant) and of decay. Placed in ground July 5, 1905; reported on April 20, 1906.

SERIES A (UNTREATED).

No.	Species.	Source of timber.	Results.
1	Red fir (heart).....	Tacoma, Wash.....	Badly eaten beneath soil surface.
2	do.....	do.....	Do.
3	Red fir (sap).....	do.....	One-half consumed.
4	do.....	do.....	One-fourth consumed.
5	Red fir.....	Bozeman, Mont.....	Entirely consumed beneath soil surface.
6	do.....	McCloud River, Cal.....	One-fourth consumed.
7	do.....	do.....	Entirely consumed beneath soil surface.
8	do.....	San Francisco, Cal.....	One-third consumed.
9	do.....	do.....	Eaten badly.
10	do.....	Coburg, Oreg.....	One-fourth consumed.
11	do.....	do.....	Eaten badly.
12	Western hemlock.....	Tacoma, Wash.....	Do.
13	do.....	do.....	Do.
14	Spruce.....	do.....	One-third consumed.
15	do.....	do.....	One-half consumed.
16	White spruce.....	Bozeman, Mont.....	One-fourth consumed.
17	Western hemlock.....	Coburg, Oreg.....	Badly eaten.
18	do.....	do.....	Do.
19	Lodgepole pine.....	Bozeman, Mont.....	Do.
20	do.....	do.....	Do.
21	Big tree redwood (S. gigantea).....	Fresno, Cal.....	One-half consumed.
22	do.....	do.....	Entirely consumed beneath soil surface.
23	Coast red wood (S. semper-virens).....	Humboldt County, Cal.....	Badly surface eaten.
24	do.....	do.....	Two-thirds consumed.
25	Sugar pine.....	do.....	Eaten considerably.
26	do.....	do.....	Do.
27	California white pine.....	Maderia, Cal.....	Do.
28	do.....	do.....	Do.
29	Western white pine.....	Humboldt County, Cal.....	Do.
30	Western white pine (Pinus ponderosa).....	do.....	Do.
31	Cedar.....	Tacoma, Wash.....	Eaten slightly.
32	do.....	do.....	Do.

Series B (treated with mercuric chloride) and series C (treated with creosote) were not attacked, and in no instance was decay noted.

Series B and C were composed of practically the same woods as were represented in series A.

In summing up, we find that all untreated woods were attacked more or less by the anay (white ant), but as yet no evidence of decay by fungus has asserted itself. It is quite evident that the untreated samples will be entirely consumed by anay before the fungus can get hold.

EXAMINATION OF PUBLIC LANDS FOR THE PURPOSE OF CERTIFYING AS TO ITS
SUITABILITY FOR AGRICULTURAL OR FOR FOREST PURPOSES.

The public-land act (No. 926) was put into force, in accordance with the proclamation of the civil governor, on July 26, 1904. The act provides for the homesteading, sale, and lease of public lands that are more valuable for agricultural than for forest purposes. Upon receipt of notice from the bureau of lands that a certain piece of public land has been applied for as a homestead, for sale, or for lease, an examination as to its agricultural or forest character is made by this bureau and a corresponding certificate is made by this office to the bureau of lands.

Since the public-land act was promulgated 398 applications for homesteads, 28 applications for purchase, and 1 application for lease of public lands have been returned to the bureau of lands with certificates that the lands applied for were more valuable for agricultural than for forest purposes. The lands applied for in 23 applications were deemed more valuable for forest purposes.

The largest piece of land applied for to be taken under lease, for which a certificate was furnished by this bureau, contained 32 hectares; the largest piece desired for purchase contained 500 hectares.

The average cost to this bureau of inspecting a single homestead in all of the districts is about ₱2.50.

Two examinations were also made by forest officers of certain lands that were claimed as private lands and held under imperfect titles. The owners desired to have these titles perfected in accordance with Chapter VI of the public-land act. One tract, with an area of about 1,000 hectares, in Laguna, was claimed by the Roxas estate, and, in compliance with a request from the bureau of lands, this land was examined by a forest officer and a certificate given by this bureau that 213 hectares of this tract were more valuable for forest purposes. Another estate of 1,105 hectares, located in the Cotabato Valley, Moro Province, belonging to the Jesuit Society, was examined by a forest officer in compliance with a request from the owners, and as a result of this examination, it was reported that the land was more valuable for agricultural than for forest purposes.

REGISTRATION OF PRIVATE WOODLANDS.

In accordance with section 24 of the forest act, titles to 8 private estates containing woodlands were registered in this office. The total area of the 8 estates mentioned amounted to 5,657.16 hectares, of which approximately 2,900 hectares contained woodland. Up to date 149 private estates are registered in this office, the total area of which amounts to 147,812.62 hectares, or approximately 365,097 acres.

The above list includes almost all of the large private woodland estates in these islands. The total area of private woodlands in the Philippines, registered and unregistered, will not exceed 500,000 acres.

An act of Congress of 1902 prohibits the sale, lease, or homesteading of public lands in the Philippines, unless same are more valuable for agricultural than for forest purposes. Timber, however, may be taken from public lands under license issued by this office.

ANNUAL CONFERENCE OF FORESTERS.

Foresters in charge of forest districts were called to Manila about the last of June for a conference and to discuss Philippine forest matters. Each forester brought with him his annual report and map of his forest district, with notes on same taken during the year and applications for licenses in his district for the coming year. These annual reports, containing descriptions of districts, methods of lumbering, information concerning labor, prices, etc., in fact, a complete review of all forest matters occurring during the year, were read and discussed.

Committees were appointed to devise a Philippine primer of forestry, to investigate the needs of the service as to field equipment, and to propose and discuss a uniform for the forest officers.

In addition to the above-mentioned work of the conference, the following subjects were discussed:

“Improvement of the forest service.”

“Work of the foresters.”

“Instruction of rangers.”

"Equipment of forest stations, including herbarium and forest-product exhibits."

"Proposed changes in the forest law and regulations"

"Free cutting of timber and how to regulate it."

"Improvement in logging methods and use of saws, American axes, etc."

Representatives of the Philippine Lumbermen's Association attended several sessions of the conference and showed much interest in questions of forest policy.

Representatives of the bureau of lands and of the bureau of internal revenue explained to the foresters points in connection with the homestead lands, land titles, and the use of new internal-revenue forms for the appraisal of forest products and forest charges. It was thought necessary that the foresters be thoroughly informed on such matters, as they are brought into immediate contact with people in the provinces who ask questions along such lines.

The botanist of the bureau of science gave some valuable hints as to the collection and preparation of botanical material.

PROPOSED DIVISION OF FOREST PRODUCTS.

In the near future a division of forest products will be established, with the following objects: To investigate the amount, character, value, and uses of Philippine forest products, and to bring this information to the notice of Philippine and foreign markets; to make special efforts to find new uses for native woods, and to bring out the useful qualities of certain abundant woods not as yet sought out by the native lumberman.

There is a large amount of valuable information in this office along the above lines which the undersigned desires to place in charge of an experienced man, who can so arrange and systematize it that it may become readily available.

The following changes have taken place in the personnel during the period July 1, 1905, to June 30, 1906:

Appointments, probational	7
Appointments, reinstatement	2
Appointments, promotion	28
Appointment, reduction in salary	1
Transfer to bureau	1
Resignations	12
Removals without prejudice (caused by reduction of force)	63
Transfers from bureau (incident to reorganization)	27
Removals for cause	6
Deaths	2

In addition, 6 temporary appointments were made for periods varying from one to ten months.

Respectfully submitted.

GEORGE P. AHERN,
Director of Forestry.

The SECRETARY OF THE INTERIOR,
Manila, P. I.

NOTE.—The following tables accompany this report and are on file in the War Department:

Comparison of tests of rope made by different manufacturers, all made of manila hemp, with one exception.

Personnel and salaries.

List of licenses.

Amount of timber cut during 1905-6 by licenses granted, 1,000 cubic meters or more.

Applications for permits to make canyons.

Applications for homestead, purchase, and lease of public lands.

Expenditures.

Report of utilization of forest products from public lands on which government charges have been collected from July 1, 1905, to June 30, 1906.

Province.	Timber.			Firewood.	Charcoal.
	First group.	Low. group.	Total.		
	<i>Cu. meters.</i>	<i>Cu. meters.</i>	<i>Cu. meters.</i>	<i>Cu. meters.</i>	<i>Cu. meters.</i>
Albay.....	82.49	674.07	756.56	572	.....
Ambos Camarines.....	197.88	3,056.29	3,254.17	4,007	.....
Antique.....	.....	9.94	9.94	.....	.....
Bataan.....	39.23	10,219.82	10,259.05	38,344	478.00
Batangas.....	12.35	202.99	215.34	541	4.00
Benguet.....	.....	849.91	849.91	5	.....
Bohol.....	123.36	926.37	1,049.73	480	.....
Bulacan.....	39.35	5,634.19	5,673.54	6,502	598.00
Cagayan.....	986.34	726.91	1,713.25	373	.....
Capiz.....	5.48	253.85	259.33	4,313	227.00
Cavite.....	.....	158.61	158.61	3,527	.....
Cebu.....	437.05	822.70	1,259.75	484	.....
Iloilo.....	87.35	1,134.51	1,221.86	21,693	279.00
Ilocos Norte.....	181.55	202.18	383.73	38	.....
Ilocos Sur.....	87.96	625.21	713.17	1,250	.....
Isabela.....	204.93	439.77	644.70	.....	.....
Laguna.....	.31	3,514.79	3,515.10	2,421	17.00
Leyte.....	207.55	1,887.73	2,095.28	5,707	.....
Lepanto-Bontoc.....	9.42	49.78	59.20	.....	.....
Masbate.....	1,077.37	1,191.08	2,268.45	7,773	35.00
Mindoro.....	1,148.66	4,263.62	5,412.28	9,448	31.00
Misamis.....	123.85	630.10	753.95	.....	.....
Moro.....	766.14	2,502.65	3,268.79	9,109	.....
Negros Occidental.....	585.87	7,182.62	7,768.49	11,441	.....
Negros Oriental.....	9.88	266.45	276.33	602	.....
Nueva Ecija.....	127.31	479.58	606.89	1,106	.....
Pampanga.....	8.50	882.36	890.86	19,540	.....
Pangasinan.....	206.09	799.29	1,005.38	5,090	184.00
Palawan.....	2,114.61	81.16	2,195.77	304	.....
Rizal.....	9.63	269.73	279.36	10,461	8.00
Romblon.....	46.69	688.49	735.18	91	.....
Samar.....	57.13	624.48	681.61	823	.....
Sorsogon.....	50.94	950.42	1,001.36	1,072	.....
Surigao.....	82.83	302.68	385.51	3,493	.....
Tarlac.....	40.99	467.00	507.99	1,855	19.00
Tayabas.....	3,013.99	5,553.77	8,567.76	18,867	.....
Union.....	35.04	174.56	209.60	708	.....
Zambales.....	94.34	3,214.29	3,308.63	2,541	1,939.00
Total.....	12,302.46	61,913.95	74,216.41	194,581	3,819.00

Province.	Dye bark.	Tan bark.	Resins.		Wood oils.	Rattan.
			Alma-ciga.	Brea.		
	<i>Qq. m.</i>	<i>Qq. m.</i>	<i>Qq. m.</i>	<i>Qq. m.</i>	<i>Liters.</i>	<i>Pieces.</i>
Albay.....	71.35	.....	.....	1,371,000
Ambos Camarines.....	16.84	.....	.....	5,418,390
Antique.....	1.96	.....	.....	.....	40,000
Bataan.....	6,421,600
Batangas.....	38,520
Bulacan.....	2,636,350
Cagayan.....	0.54	.....	.....	.....	.....	1,172,400
Capiz.....	487.65	107.70	1.57	.....	.....	.....
Cebu.....	8.83	.....	.....	504.00	112,450
Iloilo.....	68.80	.....	.....	.....	.....
Ilocos Norte.....	1.00	.....	.....	.....	24,750
Ilocos Sur.....	71,510
Laguna.....	227,900
Leyte.....	145.74	.....	.....	9,216.00	.....
Masbate.....	198.74	11.04	10.74	.....	8,101,500
Mindoro.....	96.71	2,457.70	.....	.....	.....	588,231
Misamis.....	215,000
Moro.....	1,801.95	6,114.01	.....	.....	1,250,700
Negros Occidental.....	560.00	.....	.....	17,304.00	6,990,300
Negros Oriental.....	1.25	.....	.....	45.00	683,000
Nueva Ecija.....	1,987,150
Pangasinan.....	8.12	161.26	.....	.....	.....	415,900
Palawan.....	338.18	759.14	1.30	564.00	233,790
Rizal.....	3.46	.....	.....	.....	1,802,000
Romblon.....	31.25	184.41	.08	1,302.00	225,600
Samar.....	32.41	124.00	.....	.....	9.00	325,300
Sorsogon.....	20.60	240.00	173,100
Surigao.....	697.63	.....	.....	.....	524,700

Report of utilization of forest products from public lands on which government charges have been collected from July 1, 1905, to June 30, 1906—Continued.

Province.	Dye bark.	Tan bark.	Resins.		Wood oils.	Rattan.
			Alma-ciga.	Brea.		
	Qq. m.	Qq. m.	Qq. m.	Qq. m.	Liters.	Pieces.
Tarlac.....	609.12	7.79	7.78	1.12		121,055
Tayabas.....		285.21	395.50			2,758,370
Union.....						29,200
Zambales.....	18.00		3.16			1,753,800
Total.....	1,252.55	7,002.45	7,564.80	33.84	29,244.00	45,713,566

Other forest products:

Dyewood, province of Iloilo.....	metric quintal..	14,770.00
Dyewood, province of Pangasinan.....	do.....	88.00
Gutta-percha, province of Moro.....	do.....	406.56
Wax, province of Moro.....	do.....	9.44
Diliman, province of Moro.....	pieces.....	9,000
Gogo, province of Nueva Ecija.....	do.....	6,800
Earth, province of Leyte.....	ollas.....	23,418
Earth, province of Rizal.....	do.....	300
Stone, province of Ilocos Sur.....	pieces.....	9,639

NOTE.—One metric quintal (qq. m.) equals 220.46 pounds (av.). One cubic meter equals 35.315 cubic feet (English). Rattan (bejuco) is sold in the following sizes: Whole or round bejuco, 12 to 18 feet long by $\frac{1}{4}$ to 1 inch diameter; split bejuco, 5 to 16 feet long by $\frac{1}{16}$ to $\frac{3}{8}$ inches diameter.

Imports of timber and other forest products into the Philippine Islands during the calendar year 1905.

		From United States.		From other countries.	
		Quantities	Values, United States currency.	Quantities.	Values, United States currency.
Pine, unplanned.....	M. B. M.	85	\$905		
Logs.....			11,729		\$11,325
Lumber.....	M. B. M.	9,355	113,057	5,072	182,990
Shingles.....	number.	401,000	804		
Furniture.....			39,303		36,897
Total.....			165,798		231,212

Exports of timber and other forest products from the Philippine Islands during the calendar year 1905.

		To United States.		To other countries.	
		Quantities.	Values, United States currency.	Quantities.	Values, United States currency.
Bejuco.....					\$1,541
Almaciga (copal).....			\$61		46,201
Gutta-percha.....	pounds.			50,899	4,782
Rubber.....	do.			281	93
All other gums and resins.....					11,498
Beeswax.....	pounds.			104,195	22,070
Sappan wood (dyewood).....					19,912
Other woods.....	M. B. M.	36	1,016	173	10,242
Total.....			1,077		116,339

From the Monthly Summary of Commerce, Philippine Islands, December, 1905. Prepared by the Bureau of Insular Affairs, War Department, Washington, D. C.

NOTE.—Imported by Quartermaster's Department, U. S. Army, during fiscal year 1906, 6,900,129 feet B. M. of Oregon pine.

Government charges collected on forest products July 1, 1905, to June 30, 1906.

1905—July	₱29,964.62
August	30,618.70
September	28,022.99
October	25,405.79
November	23,031.63
December	25,304.35
1906—January	13,200.13
February	18,090.80
March	13,835.14
April	14,712.49
May	16,277.30
June	18,918.18
Total collections reported	257,382.12
Unreported collections, approximately	1,800.00

Reports of forest collections from the following provinces for the month of June, 1906, not received, viz: Bataan, Benguet, Cebu, Laguna, Palawan, Romblon, Sorsogon, District of Jolo, and Neuva Ecija, for part of the month. These unreported collections will probably approximate ₱1,800.

Summary of appropriations, expenditures, and revenues for bureau of forestry since its organization, April 14, 1900

Fiscal year.	Appropriations (gold).	Expenditures (Mexican).	Revenues (Mexican).
1901.....	\$31,149.50	\$49,990.43	\$199,373.11
1902.....	84,127.62	155,269.78	348,073.08
1903.....	124,248.00	211,647.39	527,414.85
1904.....	156,884.00	304,843.37	599,480.58
1905.....	₱254,000.00	₱245,000.00	^a ₱335,067.88
1906.....	153,000.00	152,136.59	^b 259,182.12
1907.....	100,000.00	.....	.....

Reduced revenues in 1905-6 due to—

^a Government charges on timber reduced in number of provinces in May, 1904, almost 50 per cent.

^b Free cutting of timber for personal use authorized October 26, 1905.

APPENDIX D.

REPORT OF THE BUREAU OF SCIENCE.

DEPARTMENT OF THE INTERIOR,
BUREAU OF SCIENCE,
Manila, P. I., August 10, 1906.

SIR: On November 1, 1905, the bureau of government laboratories was increased in its scope by the addition of the former bureau of mines, which was merged with it as a division. At the same time the title of the bureau was changed from the one which it had held since its foundation, the new designation being "the bureau of science." In foreign countries some misunderstanding has been caused by this alteration in title, and as a result inquiries have reached us asking whether two scientific organizations had been established in the Philippine Islands; however, such misunderstandings have been few and now the institution is known as the "bureau of science" throughout the world.

The fusion of the work in mining, mineralogy, and geology with that carried on in the bureau of government laboratories has of necessity caused some rearrangement of the space in the building and a considerable amount of crowding. It will be recalled that the original plans provided that the main building should be used for laboratory purposes only, and that separate wings to be adapted for the use of the other bureaus of the government which have a more or less intimate connection with scientific study were designed, and in these wings space was to be provided not only for the work in conjunction with the mineral resources of this country, but room was also proposed to be set apart for the growing collections appertaining to the studies in botany and zoology. A fundamental prerequisite for any successful extension of our geological and petrographic studies is an adequate and systematic collection and even the daily work of the division of mines is such that many specimens which ultimately are not permanently retained, must be handled. The same may be said of botany and zoology.

The bureau, so far as was in its power, has provided for the placing of the working collections used by the branches of science which have just been referred to and to accomplish this end, space in this building was used for purposes other than the ones for which it was originally intended. Fully equipped laboratory rooms have been devoted to collections and to topographic work, and as a result the staff in the experimental scientific branches has become unduly crowded. We have been compelled to assign the room which was originally devoted to physiological chemistry to the chief of the division of mines; another, which was occupied by the serum division, to the geologists of the bureau; a third, which was used by one of our chemists, to the topographic work. Three of the rooms originally intended for medico-biological investigation have been devoted to botany and entomology, and the space set apart for pharmacology has been given to the collector of natural-history specimens. The rooms thus set aside are not adapted to their new purpose; they were planned for laboratory work, and in this field they find their most economical use.

The systematic work of the bureau, giving as it does an insight into the distribution and nature of the fauna and flora and of the geologic and petrographic resources of the Islands, is of fundamental importance and must be continued. The collections, which are necessary, must continue to grow. They are too far advanced and too valuable not to keep them up, and not to have begun them would have been a misfortune, as the time which has been gained for these important branches of scientific work would have been lost. It is too often the

complaint of scientific institutions which, in their early career, have neglected the gathering of adequate collections, that subsequent efficient work has been sadly hampered, if not stopped, by the lack of reference material. It is only a question of time when some means will need to be taken to enlarge the space occupied by the bureau of science. The collections we have should be well arranged and placed in such a condition that, just as is the library, they would be available to all without having the advent of visitors materially interfere with the daily work being carried on. Therefore, it would not only be desirable, but soon it will be necessary, to have a wing connected with this building constructed according to the original plans, not only to house in it the working collections of the bureau, but to extend its scope so as to provide space for other scientific materials to be studied and utilized by our investigators and the public. A lecture room capable of accommodating between 200 and 300 people should be an adjunct to this wing and should be well equipped for general purposes of scientific instruction. The construction of a museum building in some other portion of the city will not answer the purpose, as the working collections must be directly accessible to the persons in the bureau using them; and the moving of the members of the staff, whose work depends on these collections, to some other point would destroy the free intercommunication between the various members of the bureau, which has proved itself advantageous to all branches of work. Frequent consultations between the units of the staff are of vital importance to the bureau, and are one of the most important results gained by the system of scientific centralization which we have adopted. Were this institution in the United States there would be small doubt but that private funds could be obtained for the new wing, but situated as we are such a desirable end would appear to be doubtful.

On January 1, 1906, the original form of the publications of this bureau was abandoned and the issue of the Philippine Journal of Science undertaken. The Journal is as yet in its first volume, and seven numbers have been published. The material has been ample and the recognition which it has received is such as warrants us in predicting its permanency. It is a frequent custom among scientific men and university libraries not to subscribe to a journal until it has completed its first year and shows promise of continuing. Therefore, it is gratifying to note, that in spite of the fact that professional men in Europe and America have as yet only seen the first three numbers, the subscription list covers practically all parts of the globe. The exchanges have also been very encouraging, their value at present being nearly ₱2,000 per year, although the negotiations with many other publishers are not as yet completed. These exchanges represent a real saving, as were we not to have them, the subscriptions for these journals would need to be paid from the appropriation for the library.

Difficulties have been encountered in more ways than one. The procuring of entirely satisfactory lithographs of maps and of drawings in Manila has been difficult, but it is hoped that in the future, excepting where there is urgency in publishing an article, time enough will be available to procure our lithographs from firms of acknowledged preeminence in this line of work.

One handicap under which the Journal labors is the varied nature of the articles which fill its pages. Even during the first year it seemed advisable to separate the articles on systematic botany, of which a considerable number would with certainty be presented for publication as a series of separately paged supplements, but as the papers read at the Philippine Islands Medical Association are now available in addition to those prepared by the bureau staff, it has become evident that, in issuing the next volume, a separation can be made into at least three sections in conformity with the plan of issue of the Philosophical Transactions or the publications of the Vienna Academy of Sciences.

The subscription price of the Journal at present is \$5 a year. It would be feasible to separate the Philippine Journal of Science into three sections beginning with the next volume. One of these sections would be devoted to the biological work immediately connected with tropical diseases, the second to general scientific papers, and the third to systematic botany and botanical subjects. The subscription price should then be \$3 a year for the medical section and \$2 each for the others, the whole Journal to cost \$5 a year as heretofore. This lower total price would be a sufficient inducement to warrant subscriptions to the entire series, and yet those specialists who are interested only in certain lines would be able to procure as a complete volume that portion of the Journal which they desire. The cost of publishing in this form would be but slightly greater than it is now, as it would amount to no more than the payment for the additional covers, title pages, and indices. Undoubtedly the income to be derived from subscriptions would be increased.

A great amount of work is necessary conscientiously to edit and thoroughly to advertise a journal of this kind. As a rule, editors are divorced from the business management of their journals, but under the present circumstances it has been impossible to do this in the case of the Journal of Science. It is hoped that, during the next year, the list of subscribers will increase to an extent sufficient to warrant the employment of some one to attend to the business management of the Journal. It has been the constant hope of the director of this bureau once more to be able to devote a certain amount of his time to experimental work. It is true that very many researches are carried on in the institution in all of which the director is interested and in many of which he helps by his advice and suggestion, yet he has never, with any certainty of continuing, himself been able actively to participate in laboratory work. For this year the publication of the Journal of Science has rendered the hope futile.

The series of bulletins of the bureau of government laboratories was completed by the issue of No. 36, in January, 1906. There is now a great call for these publications and several numbers of the series are out of print.

The personnel of the bureau has suffered many changes during the year. Doctors Herzog and Lewis, and Messrs. Bliss, Hare, and Williams returned to the United States. Doctor Woolley left for Siam, there to assume direction of the Government laboratories about to be inaugurated. Doctor Sorrell, the veterinarian, was transferred to the agricultural bureau, Doctor Whitford to the bureau of forestry, and Doctor Copeland to the bureau of education, and as a result we have been compelled to call upon the civil service board for many renewals in the force. At present, we are looking forward to two further changes in the chemical division. This condition is unfortunate from the standpoint of economy, for everyone who newly enters the bureau must of necessity be ignorant of the field of work in the Philippine Islands, and must be with us at least a year before his full value is developed. While it has been found possible to secure efficient men of reputation in the higher salaried positions, the same can not be said of the ones which carry a yearly stipend of between \$1,400 and \$1,600. During the entire year we have been unable to secure a satisfactory botanist at \$1,400, and as yet have no certainty as to the three chemists at \$1,500 to \$1,600, respectively, whom we are seeking in the United States. This would seem to be an argument in favor of the belief that the lower places are not paid adequately enough to secure the proper men, yet I am rather inclined to the opinion that the chief reason is to be found in a disinclination of scientific workers to leave their own country where the field for investigation is certainly adequate, to come so far abroad, even though we pay much higher salaries than they have been receiving in their home institutions. It is also possible that the conditions of the service in general are not sufficiently understood, and that some who have returned during the earlier years of organization, have given more or less unsatisfactory reports. However that may be, the opportunity certainly is a good one for energetic and well-trained scientific men, and if good and capable young men can be obtained for the lower posts, nothing will stand in the way of their promotion to the higher ones. By means of the present arrangement of the salary list, the distinctions between the various divisions of the bureau can gradually be abolished, so that a properly equipped man, entering at one of the lowest positions, can have before him the opportunity for promotion upward through all the authorized salaries of the institution. This flexibility in the appropriation will very much increase the rapidity with which a new employee would advance, as he no longer will be compelled to wait for vacancies in his own particular laboratory, but would have an opportunity for advancing whenever a vacancy took place in any division, provided always he showed himself to be capable and fit for promotion. It is a fact that men who have entered the bureau three years ago at a salary of \$1,600 a year, are now receiving \$2,000, and by reason of future changes will soon be enjoying still larger incomes.

It is to be hoped that, owing to the recognition which the bureau has obtained from scientific institutions and societies throughout the world and the growing feeling in America that in the Philippines we now have a thorough organization of high standing, with ample facilities and an efficient means of bringing its work before the world, well-equipped young men will be willing to enter the bureau in the lower positions, with the hope and expectation of working their way to the top. The difficulties which have existed in the past will become less as time goes on.

Every member of the laboratory force must have spent much time and money in his preliminary education. He must be a graduate of a university, and in addition must have done graduate and research work. Many positions in the United States are open to such graduates, and therefore their condition in the Philippine Islands should be so improved, and they should have such congenial surroundings that they would not feel any loss owing to their having joined this bureau.

Conditions have improved in the past few years, and we look for still greater advances in the future, but obviously men who have been compelled to acquire their preliminary training at so much expense feel that they are entitled to more consideration and probably to more salary than are incumbents of other positions who bring with them nothing but an ordinary education and equipment.

Contact between the various members of the bureau has this year been promoted by the organization of two journal clubs, one in the biological, the other in the chemical division. In these journal clubs the current literature is reviewed and discussed. This procedure has done much to promote a feeling of scientific unity among the members of the staff, and it is hoped that it can be extended in the future so as to include the other branches of work as well. Scientific isolation is the greatest handicap we have to contend with in the Tropics, and this condition can only be ameliorated by the freest and most general contact among the members of the force.

THE LIBRARY.

The library has shown a steady growth. Many of the sets which were ordered at the time the bureau was organized could not be obtained in a complete condition, and frequently many shipments were delayed for from three to four years. This necessitated our constantly retaining balances from past fiscal years, and ultimately the task of keeping them in order became burdensome. Some of these balances lapsed and reverted to the treasury. As a result it was finally agreed to cancel all back orders for books and to renew them in the present fiscal year, the money to meet these new obligations being provided by economy in the entire bureau during the course of the fiscal year 1906. The result has been very successful, as, by reason of renewing these orders with other dealers, we now have on the way a considerable number of complete sets which we were not able to obtain through the old orders.

The cataloguing of the library and the preparation of a shelf list has progressed as rapidly as circumstances would permit. Owing to the lack of quarters, library shelves, and clerical assistance in the first years of the organization of the bureau and at the very time when books were being rapidly received, the cataloguing, accessioning, and the preparation of a shelf list fell far behind. The librarian's time was taken by the details attendant on the purchase of books and the checking, preparing for binding, placing on the shelves, and tracing of the various parts of volumes through the rather complex payment vouchers. This task was rendered much more difficult by the fact that in many of these vouchers attempts had been made to translate foreign titles into English, and in any event they had been prepared by persons not familiar with books or with foreign languages. As a result, the deciphering of the details which are necessary properly to classify a library has been most difficult, and therefore a card list, representing each book purchased, together with the necessary data, has only just been completed. The difficulties have also been increased by the fact that we have received as free gifts from the United States and from foreign Governments, from academies and societies, many series and pamphlets, all of which must be taken care of and shelved in the same way as books purchased. In a library which not only has a large subscription and exchange list, but which also receives many unbound books, the preparing of volumes for the bindery is no small task. The work must be carefully done, the sets must be complete with indices and illustrations, and on their return they must be checked to see that no part of them has been wrongly bound or mislaid.

The responsibility and duties connected with this work fall on the librarian, and in addition she must constantly be prepared to assist in finding books of reference, to loan books, and to call them back when taken out on cards and in other ways to facilitate the circulation of scientific literature.

The fundamental principle in the establishing of a library of this kind is at the beginning to obtain books as rapidly as possible, to place them on the

shelves with the least possible delay, and to have them available for use, for only by this means can the library become an adequate adjunct of the scientific work, but such rapid accumulation of material necessarily brings with it the impossibility of attending to all the details which are necessary to thoroughly accession and catalogue. When the librarian has to be business manager and cataloguer, when she must attend to the circulation of the books, to the binding, and in addition to the mailing of the publications of the bureau, it is manifest that her time is more than fully occupied. At home, library institutions of the size of our own, certainly have four or five assistants in addition to the librarian. We have been able to do much with the librarian alone and with two Filipino helpers at a salary respectively of \$25 and \$20 United States currency per month, but we can not do all, nor can we catalogue and classify as rapidly as we could wish with this force. In the past few months much assistance to the librarian has been given by using the spare time of the stenographers of the bureau, and for two months we temporarily engaged a library cataloguer to start the work of classification, but such fragmentary and desultory work is not as effective as continued endeavor. It is to be hoped that in time we will be able to secure one or two well-educated Filipinos who will be willing to enter the institution with the intention of fitting themselves for library work, and who will be willing to remain with us. Such helpers at first would need to be contented with very small salaries for they would be of but little value, but it is only by this means, namely of beginning with educated Filipinos at small salaries, that we ultimately can hope to secure a properly trained corps of library assistants.

During the past year the library, through the honorable, the secretary of the interior, received ₱2,906.80 as its portion of the payment by Mr. E. E. Ayer, of Chicago, for a set of the photographs of the Philippine government. The catalogue accompanying this set was prepared by Mr. Worcester, and the sum thus made available represents the difference between the authorized sale price of the prints and the amount paid by Mr. Ayer for the prints and catalogue. The thanks of the bureau are due both to Mr. Ayer and Mr. Worcester for their efforts in behalf of the library.

THE DIVISION OF BIOLOGY.

The biological laboratory during the past year has been very much hampered in its work by the sickness and absence of a number of the members of its staff. Doctor Musgrave was on leave in the United States during the latter part of 1905; Doctor Herzog left in April, 1906, and his successor did not reach Manila until toward the end of July; Mr. Hare returned to the United States on the 1st of January, 1906, and Doctor Ohno who took his place did not reach Manila until the 21st of June. Nevertheless, many important results were obtained. Despite the routine work which at times, owing to the recrudescence of cholera, was very severe, the development of our cholera vaccine by Doctor Strong continued, and its manufacture was undertaken by Doctor Ruediger of the serum laboratory. The process by which this vaccine is prepared is one which requires the most intense attention to detail, and any variation from the prescribed method or contamination by other organisms are fatal to its success. In spite of these facts the bureau was able to prepare for use a sufficient amount of vaccine to enable it not only to vaccinate all who volunteered for this purpose at the laboratory, but also to undertake work in the field, the latter being chiefly carried on by Doctor Edwards and Mr. Clegg.

The first provincial point at which any extensive cholera vaccinations were practiced was Angat and its barrios in the province of Bulacan, where 1,078 individuals (about one-sixth of the inhabitants) were vaccinated. Since that time, and although cholera has appeared in the surrounding pueblos, especially in Baliuag, which is situated below Angat on the same river, but 11 cases of cholera, all among the unvaccinated, have been reported from the town of Angat.

The next places visited were Siniloan and Mabitac, in Laguna Province, where 1,879 and 527 persons, respectively, were also vaccinated. These villages do not offer the same opportunity to draw conclusions as to the results, because cholera has not to any great extent appeared in their neighborhood since they were visited by our men, but nevertheless it should be stated that there was but 1 case of cholera in Siniloan since the vaccinations. In Manila, on Calle Antonio Rivera, 116 received cholera vaccine and, although some cholera has occurred in this street since that time, none has appeared among those vaccinated. At

Malolos 300 individuals were vaccinated, but as yet the work there is too recent to be reviewed.

In Bilibid prison one-half of the prisoners were given cholera vaccine early in September, 1905, and afterwards no cases of cholera appeared in the institution until quite recently, the disappearance of cholera in the prison being simultaneous with the vaccinations but due to other sanitary measures. In the month of June, 1906, one of the vaccinated inmates became infected and died. As the interval between the time of vaccination and the date when cholera reappeared in Bilibid was about ten months, it seems certain that the immunity originally conferred must have disappeared.

Vaccination in which the specific vaccine confers a blood immunity against typhoid has been practiced in the German army, especially among the forces which have been sent to Africa, and it is an incontestable fact that the frequency of the occurrence of the disease among these troops was much lessened by the use of vaccine. In addition, it is established that the infection in the vaccinated takes a much milder course than it does in those who have not been so treated. As the cholera vaccine also confers a blood immunity which is even a higher one than is to be obtained by the use of typhoid vaccine, the conclusion is obvious that vaccination against cholera should protect even in a greater degree than does that against typhoid. It is the opinion of all who have been actively concerned with this work in the bureau that the method best adapted to limit or to eradicate endemic cholera in any country is by vaccination, just as smallpox has been limited by similar means. That vaccination will entirely remove cholera from a given country is not to be supposed, any more than that smallpox vaccination has accomplished the same end with the disease against which it is practiced, but vaccination against cholera would certainly remove the danger of extended epidemics, just as has been the case with smallpox, and consequently it would remove the necessity for a burdensome and costly quarantine and for many other disagreeable sanitary measures.

In order to prepare large quantities of cholera vaccine, machinery adequate to the purpose must be purchased. Among other pieces of apparatus a somewhat expensive centrifugal, capable of taking from 10 to 12 liters at a time, is necessary. Therefore the bureau has not felt justified in buying and mounting a centrifugal in advance of any fixed policy to begin general vaccination which might be adopted by the health authorities. If such a course should be decided upon, the apparatus could be ordered promptly and large quantities of vaccine could be furnished within four or five months after the date when the decision would be reached.

Although plague has not by any means been as prevalent as cholera, nevertheless the biological laboratory has continued to develop a plague vaccine by a method depending upon the use of attenuated organisms. The protection to animals afforded by this vaccine is not perhaps as uniform as in the case of the prophylactic against cholera, but nevertheless in the blood immunity conferred it is superior to any of the previous methods adopted. While working in this direction Doctor Strong has also investigated the immunizing powers of the aggressins, but has come to the conclusion that as a prophylactic against plague our vaccine is much better.

Doctor Musgrave has continued his work on amœbic dysentery, besides taking the daily service at Bilibid prison. The results have been most interesting in several particulars, the conclusion having been reached that amœbæ which have been isolated from the stools of dysenteric patients and which, together with their symbiotic organisms, were apparently virulent eighteen months ago and capable of causing liver abscess constantly, have, after being transplanted in culture during many months, become avirulent and powerless to produce this pathologic result. Furthermore Doctor Musgrave has reached the conclusion that the various types of amœbic liver abscess are only brought about through amœbic infection when a condition of previous toxic weakening of the organ had occurred.

The autopsies at Bilibid prison have been a most prolific source for the discovery of infections by animal parasites. Doctor Musgrave up to the present time has encountered five cases of paragonomiasis, two of which were general infections. The fact that during the last few months so many instances, both fatal and otherwise, of this class of infection have been encountered, has made apparent the necessity of a member of the laboratory staff who is a medical zoologist, and therefore fully conversant with the methods employed in determining and cultivating organisms of this class. Steps have already been taken to secure a properly equipped man for this work.

Doctor Herzog, before his departure for the United States, was given an opportunity to proceed to Japan to study the large amount of beri-beri material which had been collected in that country by reason of the return from the front of many soldiers suffering from the disease. When he again reached Manila he continued his studies with the material which was available here and demonstrated that the specific organism of the disease has not as yet been isolated, as was supposed to be the case by Okata and Kokubo in Japan. The results of his work on beri-beri have been published in two extensive papers.

The routine of the biological division has been very heavy, and therefore the other members of the staff have had but limited opportunity for extended investigations. During the cholera vaccinations in the provinces, which were mainly handled by Doctor Edwards and Mr. Clegg, the research work of the other members was necessarily restricted.

The army board for the investigation of tropical diseases has recently been given space for work in the biological laboratory, and the results of their investigations will be available for publication in the *Philippine Journal of Science*.

The work in the botanical section of the biological division has continued under the direction of Mr. Merrill according to the plan adopted in the past. The endeavor to build up the herbarium as rapidly as possible, the classification of materials, and the compiling of data of use in the economic problems of the islands have continued without cessation, so that at present there are 28,823 mounted sheets in the herbarium, 7,978 specimens having been received during the year just completed.

Material has generally been identified upon receipt, and in any event as rapidly as possible, and, owing to the fact that the library is now well equipped and the herbarium a representative one, the work has been more advantageously advanced than at any time during the past. Our relations with foreign botanists have been most cordial, and the classification of our material and our botanical publications have shown the results of cooperation with them. We have obtained identifications from many specialists and, in addition, their manuscripts in most instances have been submitted to us for publication. We have also entered into agreements with a number of institutions facilitating exchanges. As a consequence it may safely be stated that we now have the most important and representative Philippine herbarium in the world, and that the center for botanical work on the Philippine flora has been transferred to Manila. The herbarium is at present in such a condition that it can begin to serve as a basis for monographs on special groups of Philippine plants which are of value from an economic standpoint, and with this end in view a study of the rattans of the Philippine Islands has been begun and it is now well advanced.

We are now in a position to take up histological work, and as a consequence Doctor Fexworthy has begun a microscopical study of the leading Philippine commercial timbers with the object of discovering characters which will facilitate ready identifications, but, apart from this, the development of the herbarium has of necessity left many economic problems for the future.

Another handicap to botanical work in the bureau has been our inability promptly to secure a properly equipped man from the United States to take the place vacated by Doctor Whitford. The needs of botanical investigation are many. We should have a mycologist, an economic botanist, and a plant pathologist, but as we have but one position vacant we are compelled to choose between the various branches we wish to study and to take whatever opportunity may be offered to obtain a botanist equipped in any one of the three fields mentioned. It is to be hoped that the vacancy will be filled in the near future, so that our botanical development will begin to assume a broader scientific aspect than it has in the past. In spite of all obstacles, the progress has been most satisfactory and the possession of our herbarium is the best guaranty of continued successful work in the future.

The exchange of botanical duplicate material has continued, and especial efforts have been made to secure specimens of the flora of the Indo-Malayan region in return for our output. The distribution of exchanges during the past year has been on the basis by which a specimen would be returned for one sent, and the results due to the adoption of this system are now apparent, for the herbarium of this bureau will soon be representative of the flora of the entire region surrounding the Philippine Islands. After this end is attained studies of relationships between the flora of these regions and that of the Philippine Islands can be most extensively carried on. As many of the countries have

been more thoroughly explored than the one in which we are, the practical advantage of this phase of the herbarium is apparent.

The entomological section has not been as favorably situated for advance as the botanical one. It has suffered from the fact that the routine work of pinning and preserving specimens has devolved upon the trained employees of the bureau, sufficient funds not being available to permit of training Filipinos solely to do this class of work. It is not an economic procedure to have the higher paid scientific staff occupy its time in work which could be assigned to persons at a much smaller rate of pay, and it is hoped that during the present year, by judicious management, the bureau will be in a position to assist the entomologists in this work. The chief lines of investigation have been on the insects attacking the coconut palm, the results of which have been published; upon the locusts, which attack the crops in the islands, and upon the mosquitoes occurring in the Philippines. The work on the locusts was interrupted at the beginning of the dry season, owing to the death of all of our experimental material; that on the mosquitoes is progressing most favorably, and as soon as possible will appear in the form of a series of papers.

Mr. Banks made an extended visit to the provinces of Bulacan, Pampanga, Nueva Ecija, and Tarlac for the purpose of studying the best means of combating the locust plague and of instructing the inhabitants in the methods to be adopted for the destruction of the insects. This opportunity was used to transfer a large number of locusts to this bureau. These were cared for in a cage built for the purpose. The result was that a great advance has been made in our knowledge of the life history of these insects, but the entire picture is not as yet completed.

The use of locust fungus has not been successful, and confirming this result we now have news from South Africa that in that locality this method of combating the plague of insects has also been abandoned. In the latter country the method recommended is the extermination of the newly hatched young by fire and the driving of the larger individuals, which attack the crops, into trenches, there to be covered with earth or crushed. This has been the most efficacious method in the Philippine Islands and has been the one recommended in the provinces visited by the entomologist. In South Africa sodium arsenite is being used against locusts, and there it is believed that this chemical will be the remedy of the future. This bureau will endeavor to undertake some work in this field during the coming year.

The work on mosquitoes was begun by a visit to a temporary camp distant some 4 or 5 miles from Manila, where a party was surveying the route for the new waterworks and in which a number of cases of pernicious malaria had occurred. Three species of *Anopheles* were discovered. This work supplemented much that had been done in Manila; but as it seemed desirable to go to a place where all altitudes could be considered and where mosquitoes occurred in abundance, the entomologist visited Negros and studied the problem at various heights above the sea, at the same time investigating the occurrence of latent malaria among the inhabitants.

The question of limiting the mosquito pest of these islands is still one to be considered in the future, but from a hygienic standpoint it will need to be undertaken before many years have passed.

The entomological section has also paid attention to the introduction of silk-worm culture in the Philippine Islands, but the work is not sufficiently advanced for further mention. When completed, recommendations will be published.

Many requests of a routine nature looking to the destruction of pernicious insects have come to the Bureau and advice has been given to the best of our ability. The insect collection has grown satisfactorily during the year and many new species have been added to it. Mr. Willy Schultz has taken a large number of specimens to Europe, while on his leave of absence, it being his intention to spend some months at the British Museum, there to occupy himself with the work of identifying the material.

Mr. R. C. McGregor, who is in charge of the section of the biological laboratory which is devoted to the collection of natural history specimens, returned from his leave in the United States on March 6, 1906, having been absent for seven months, and soon after his arrival, together with the native collectors, was sent to Bohol and Cebu, there to continue his work. Owing to this absence the ornithological material collected was not as extensive as in the preceding year, although the native collectors were kept in the field as much as possible. The interesting results of the year's work in systematic ornithology have nearly

all been published in the Philippine Journal of Science. The more extensive task of correlating our results and of publishing descriptions of Philippine birds, based upon the work which has been done, will begin during the coming year.

A Hand-List of Philippine Birds was prepared by Messrs. McGregor and Worcester and issued as the last number of our series of bulletins. In addition to its intrinsic scientific value this hand-list will be useful in the bureau for the purpose of checking duplicates which can be supplied for exchange and sale. Exchanges have been entered into for a number of duplicates in our ornithological collection, and during the next year we hope still further to perfect the arrangements by which our representative collection can be increased.

A set of duplicate bird skins was sold to Mr. E. E. Ayer, of Chicago, the material being shipped on April 1.

THE DIVISION OF CHEMISTRY.

The chemical division during the past year has for the first time been able to enlarge its investigations more extensively in economic fields, and as a result fundamental advances have been made.

The changes in personnel have not been so great as they were in the biological laboratory, Doctor Lewis and Mr. Bliss being the only ones who returned to the United States, their places being filled by Doctor Bacon, from the University of Chicago, and by Doctor Cox, from Leland Stanford Junior University. This stability of the force is a sufficient reason for the large amount which has been accomplished.

Doctor Clover, besides having direction of all the chemical work, has continued the investigation on gums and resins, devoting himself especially to the terpenes and sesquiterpenes which may be obtained from them. A paper on Philippine wood oils has already been published, covering the oil of supa gathered from *Sindoro supa* Merr., oil of apitong from the *Dipterocarpus grandifolius* Blanco, and oil of panao from *Dipterocarpus vernicifolius* Blanco. From all of these oils sesquiterpenes of the very highest quality have been obtained.

Oil of supa can be gathered in these islands in considerable quantities. The general value of sesquiterpenes as pure as the ones which we have obtained has not been established in the world's market, but samples have been sent to the United States and have received most favorable comment. Naturally, in order to introduce this class of oils to extended use, a market must be created, as in the general trade they are but little known; but our investigations will give opportunities for those who are interested to establish a sale.

Another interesting feature of Doctor Clover's investigations has been the fact that in the various resins known in the market as Manila elemi, to be obtained from the pill trees (*Canarium luzonicum* A. Gray), we have not only encountered different terpenes, but each individual tree, apparently of the same species and derived from a stand where the trees are close together, yields its specific terpene. The oil which has been obtained from Manila elemi therefore is a mixture of several terpenes, as no care has in the past been taken to isolate the oil from distinct trees which have been identified botanically. By this means Doctor Clover has been enabled to procure for himself for study considerable quantities of pure materials.

Work on Philippine fibers and fibrous substances for the purpose of investigating their suitability for paper making has been carried on throughout the year by Mr. Richmond. In order successfully to prosecute this work in a way which would give the data necessary for the paper manufacturer some rather large apparatus, typifying the machinery in use in the paper factories, was constructed in Manila. The results have shown that we have in our Philippine grasses, cogon (*Imperata exaltata* Brongn) and talahib (*Saccharum spontaneum* Zinn), in the waste from the hemp stripping, the bamboos, buri palm (*Corypha umbraculifera* L.), the plantains, the husk from the cocoanut, and in several Philippine woods an extensive material for the successful manufacture of paper. Cogon and talahib, which at present occupy such large waste areas in the Philippines, can at comparatively small expense be manufactured into a very good quality of paper, and the waste from the abacá yields a pulp of the very highest grade.

The first portion of the work on paper has already been published, and in it are given all of the data necessary for the paper manufacturer, because our facilities for this line of investigation now are sufficiently ample for us to approximate factory conditions and to make exact statements respecting the availability of our materials. The second portion of the work is nearly ready for

publication, and the data necessary to give manufacturers information in regard to the available supply of these raw materials, their cost, the expense of chemicals and machinery, etc., are rapidly being completed, and they will be available during the next year. It is hoped that this portion of the work will establish a new industry in the Philippines.

Mr. Richmond has also undertaken a systematic study of various oil-bearing seeds and fruits of the Philippine Islands, the oils being investigated for their utility in the manufacture of paints and for edible purposes, and a large portion of the data now gathered will be ready for publication in the near future. In this very interesting field several oils, hitherto of no commercial value, have been studied and a distinct commercial advantage to be derived from their use demonstrated.

Mr. Walker has completed and published his work on the oil produced from the cocoanut, which has continued for more than two years. The series of tables showing the relation between the oil contents of the nuts and their age and the quality and quantity of copra produced by trees in different situations have already proved of use to oil manufacturers. The study of the causes producing rancidity in cocoanut oil has also been of great importance, and the demonstration that pure oil practically keeps for an indefinite period, as its rancidity is caused by mold in the copra and by impurities brought into the oil during the process of pressing, has been very useful in advancing our understanding of the conditions under which the oil must be preserved and copra dried and shipped. A study of the oil to be obtained from pili nuts has also been completed, but owing to our present lack of commercial data covering the availability of the nuts and the amount which can be secured in the Philippine Islands publication has been postponed.

We have finally been able to take up the study of the medicinal plants of the islands, and Doctor Bacon, who arrived less than a year ago, has begun this important branch of work. The investigations will gradually be extended over as large a field as possible, the chemists working in close cooperation with the botanists. Much material has already been gathered, but a discussion of the results would be premature.

Doctor Cox has recently arrived to take charge of the work on weights and measures planned for this bureau. As he has been especially interested in chemistry connected with minerals, he has undertaken the study of the gas produced by our Philippine coals, and has shown that much can be expected from them as a basis for "producer gas." His results will be published during the following year.

The routine work of the division has been quite heavy; practically it has taken the time of three men, Messrs. Vivencio, Fox, and Salinger, and at times other members of the force engaged in research have been obliged to abandon their work of investigation to take up that of analysis.

THE DIVISION OF SERUMS AND PROPHYLACTICS.

Doctor Woolley, chief of the serum division, left the bureau on April 1, and after that time Dr. E. H. Ruediger took charge as acting chief until July 1, 1906. On that date, after due consideration of all of the interests involved and because of the close relationship existing between serum work and the medical work in the biological laboratory, it was decided to abolish the serum division as a separate entity of the bureau and to unite it with the biological division under the general direction of Doctor Strong, chief of the biological laboratory, with Doctor Ruediger as assistant and in immediate charge. The closer union of the biological and serum work can not fail to be advantageous to both after sufficient time has elapsed for the chief of the biological laboratory to become thoroughly familiar with the methods which have been employed. The cooperation which will be gained will undoubtedly result in an even more careful standardizing of the serums than has been practiced in the past and will enable us more efficiently to prepare our cholera and plague prophylactics, the development of which was due to the biological division.

At this time a change is contemplated in the system of caring for the rinderpest serum cattle, by which this portion of the work will be transferred to the bureau of agriculture after January 1, 1907. After this date the bureau of science will only be charged with the scientific side of the preparation and standardizing of rinderpest serum. This will render the direction of the serum laboratory more simple and will enable it to devote more of its time to the development of its proper sphere, and will also be a financial saving for the gov-

ernment, as the animals will be cared for on a farm situated a few miles from Manila. The work in the serum division during the past year has consisted in the preparation of rinderpest serum, antiplague serum, plague and cholera vaccine, diphtheria and tetanus antitoxins, mallein, and vaccine virus for smallpox.

Up to the time of Doctor Woolley's departure Doctor Ruediger especially took immediate charge of the preparation of all of the serums and prophylactics, with the exception of rinderpest serum, the making of which was carried on at San Lazaro by Doctor Sorrell. Doctor Sorrell accepted a position in the bureau of agriculture, as a promotion, in February, 1906, and Doctor Shealy, veterinarian of the same bureau, took his place. Doctor Shealy in turn was transferred back to duty in his original position in July, and Mr. Newby is now in charge.

The plague serum has been much improved during the year, owing to immunizing the horses by means of virulent cultures. The difficulties of preparing cholera vaccine have already been dwelt upon, and here it may be added that a constant and painstaking care is the only guaranty of success. During the year we have for the first time been able to immunize horses to a sufficient extent to have on hand a supply of tetanus antitoxin. This product has now been added to our list and is available for distribution.

Mr. Cheek, who has had charge of the preparation of vaccine virus, has undertaken a series of experiments to demonstrate the antiseptic value of glycerine in this preparation and to determine the value of benzol and toluol as sterilizing media for vaccine virus. His results have shown that after the addition of glycerine to vaccine virus there is a gradual decrease in the number of contaminating organisms, the virus being sterile after three months. It has been found that invariably the specific cause of vaccinia has been destroyed simultaneously with the contaminating organisms, so that bacteriologically clean vaccine is always inert. No difficulty has been found in keeping a sufficient amount of vaccine virus on hand to meet all demands.

The preparation of rinderpest serum has been modified during the year, as the method formerly employed of gathering the serum in cylinders has proved itself to be unreliable because of the great difficulty in preventing contamination by means of organisms, especially during the dry season. The result of this contamination has been that a large number of bottles of rinderpest serum which had been kept for some time were of necessity destroyed as useless in the latter part of this year. For this reason we have changed to a method by which the serum is collected in side-necked filter flasks by means of a vacuum. We are thus able to produce a more uniform product, with the minimum danger of contamination.

During the first part of the year it was thought possible to gain additional quantities of serum by centrifugalizing the blood clots, but subsequent experiments have shown that the serum so separated was always profoundly contaminated with organisms and therefore valueless. As a result this method, after a thorough trial, was abandoned.

During the first part of the period under consideration a great difficulty in obtaining virulent blood was experienced, but a canvass of the available cattle in the islands developed the possibility of importing animals from Sibuyan to be used as nonimmunes, and since this importation was begun we have had but little difficulty in keeping up the supply, although at times, owing to stress of weather, importations were long overdue. However, the animals are small, and their cost is relatively high, because only small lots are brought to Manila, so that it is always a source of regret that we are unable to find a cheaper and equally reliable source of virulent blood.

As a result of strenuous efforts the former dearth of rinderpest serum, which had come to be a serious matter, was relieved, and before the end of the year there was in the cold storage a large stock on hand. As a result, we were enabled to cut down the rinderpest herd as rapidly as the animals acquired so high an immunity that the giving of virulent blood to them was no longer profitable. However, in the past six weeks there has been a very large demand for rinderpest serum, so that we are compelled once more to increase our herd to larger dimensions. This is rendered difficult by the fact that we can not now call for the cattle purchased by the government from Shanghai, as these have all been sold, so that in the future we must rely upon the local market. Large animals suitable for serum purposes are very difficult to obtain in Manila, and consequently the purchase of a proper herd of serum cattle will not only take time, but the animals will not be as satisfactory as were the ones used in the past. Shipments of cattle from Shanghai to Manila have entirely ceased. Owing to

this fact we have made attempts to utilize the large Australian cattle which are being imported into the islands.

The risk in immunizing these cattle is much greater than it is with the Chinese ones. At first we experimented with immunizing 28 Australian calves, and of these 15 passed through the process without serious trouble, 2 died of rinderpest, 4 of a complication of rinderpest and foot and mouth disease, and the others of various other diseases, such as gastritis, Texas fever, etc. Six large Australian cattle were all successfully immunized in the latter part of 1905. At a later time we purchased 6 Australian cattle; 3 of these were lost through rinderpest; the remaining 3, although they acquired the disease, were saved by the use of intravenous injections of antirinderpest serum. An attempt will be made to utilize these large animals for serum purposes, although the difficulties to be encountered are great because of their strength and wildness, which makes it a serious matter to handle them on the operating table. It seems reasonably certain that a large percentage of the Australian animals can be immunized against rinderpest, although they are extremely susceptible, and if they can be handled we will use them to increase our serum herd. Their original cost is high, but at least two or three times as much serum can be obtained from each of them at a bleeding as from the Chinese animals, whereas the feed for the former is not much more expensive than it is for the latter. The use of these Australian animals will probably enable us once more to prepare serum in large quantities, but probably there will be an interval during which only a limited supply will be available.

During the first part of the year the possibility of obtaining animals for serum purposes from the bureau of supply diminished the cost of production of rinderpest serum. Now that all must be purchased, the expense will naturally be somewhat increased.

Doctor Woolley carried on some research work on rinderpest, the results of which have been published in the Philippine Journal of Science.

The occurrence of some cases of tuberculosis among imported cattle in these islands will probably render it necessary for the laboratory to add tuberculin to its list of preparations.

THE DIVISION OF MINES.

The coal resources of the Philippine Islands promise to fill local needs in the future. So far as we now know, coal areas exist in Luzon, Batan, Polillo, Mindoro, Masbate, Negros, Cebu, Samar, Leyte, and Mindanao. The present price of Japanese or Australian coal is very high in Manila; we now are paying ₱11.58 per ton of 2,000 pounds for Japanese coal delivered at this bureau. The lack of a cheap and good quality of coal is one of the greatest commercial obstacles we encounter in the Philippine Islands, and therefore it has been the endeavor of the division of mines to push the study of the coal deposits as rapidly as possible.

During the past year Mr. W. D. Smith, who already had carried on some geological and reconnaissance work upon selected coal fields in the Philippine Islands, was sent to Cebu. He traveled over that island, and his preliminary survey demonstrated a probability of favorable returns from coal development. Following this reconnaissance, he undertook a more complete investigation of the coal fields of the Carmen-Compostela region. Upon his return, after two months' absence, Messrs. Goodman and Ickis, field assistants, were sent to the same portion of Cebu to make a topographic survey and map of the region which it was proposed more extensively to study. This map is now practically completed, and when it is in suitable form Mr. Smith will return to the island, if necessary, accompanied by Mr. Goodman, to complete the work. The results will be published as soon as they are available.

Petroleum has long been known to exist near Toledo, in Cebu, and in Tayabas, but has not been developed, and since the insurrection but little exploring work has been done. However, it is proposed to return to these places also and investigate the occurrence of mineral oil.

The analyses of the Compostela coal have been fairly satisfactory, and the same may be said of its gas-producing power.

The question of the manufacture of producer gas and the utilization of the lower grades of coal has been brought into prominence in the United States since the experimental work carried on by the United States Geological Survey

in 1904 at the Louisiana Purchase Exposition, because the results of this work seem to show that even the poorer grades of lignite may be made to yield values in excess of those of the best grades of coal when the producer gas is used in gas engines.

The question of the development of the Philippine coal fields and of the most economic utilization of the grades of lignite and of bituminous coal is of fundamental commercial importance to these islands and it is certain that an adequate number of geologists to map the coal areas and to publish the data regarding the availability of the deposits within a reasonably short time would much more than repay the necessary outlay. The investigation of the Cebu coal fields, for example, has taken the time of the two topographers of the bureau and of Mr. Smith for at least four months, and a return to the field to plot the geologic features on the topographic map will be necessary. During this time work on other coal fields is at a standstill. The transfer of the bureau of mines to the bureau of science as a division will enable the chief of the division on his return from the United States on leave to take the field himself and in this way we will be able to cover a larger area more expeditiously, but even under these circumstances it would be advantageous to have more men in the field, so as to obtain extensive economic results which will be of commercial advantage in developing the material welfare of the islands.

The policy of pushing work as rapidly as possible in certain individual fields is being carried on, but with the force on hand, even with concentration of effort, the area which can be covered in a year is but a small one. These arguments emphasize the statement given above that it would be a profitable undertaking for the Government sufficiently to enlarge the force in the division of mines to enable it to cover more territory in this important mineral branch in a less space of time.

While the division is very much interested in the coals, it can not neglect the other mining fields which promise to increase the prosperity of the Philippines. The work of Mr. Smith during the year has been in the coal fields, but he also must do all the paleontologic investigating for the division. The importance of this class of work can not be underestimated, as the knowledge of the fossil deposits of one region, where coal beds occur, gives an indication of other probable occurrences in other parts of the islands. A paleontologic study of one region and a knowledge of the fossils there encountered serves as a guide to what may be expected in another situation if the same fossils are met with.

The attention of Mr. Eveland has necessarily been directed to field work in regions where mining operations for ore-bearing minerals are under way, and from November until April he was in Benguet preparing a report and map on this important region. The map is now complete and the work of compiling the geologic results well under way. The paleontology and stratigraphic geology of this region will be developed by Mr. Smith in conjunction with Mr. Eveland.

The mining field in Masbate has not been neglected. The chief of the division visited this region to make a preliminary survey of the mining conditions to be encountered and of the results obtained in the district of Aroroy. His observations have warranted the determination to send Mr. Eveland and Mr. Goodman to Masbate as soon as their present work is completed to make a topographic survey and a geological reconnaissance of the region. There are many other problems which have been undertaken, but which have advanced but slowly, owing to the lack of numbers in the divisions. These questions include the investigation of limestones for economic purposes, of clays, building-stone deposits, rocks suitable for cement making, and of other materials which would be of value for structural purposes in the Philippine Islands; the investigation of the placer-mining industry and dredger ground in Pampanga, Nueva Ecija, and Rizal; the placer-mining fields of Pigtao and Misamis, Mindanao; the mineral resources of the Agusan River region in Surigao and Placer, Mindanao; the exploratory reconnaissance of the mineral resources of the Cagayan River valley, and so forth.

The review prepared by Mr. McCaskey of the work done in Philippine mining and mineral resources during the past year would be too extensive for an annual report, and therefore such information as we have available will be published in a separate pamphlet, to be issued by the bureau. The individual results obtained by the geologists during their work in the field, together with the maps which have been prepared, will be issued in the Philippine Journal of Science. In the future the bureau purposes to publish all of its maps in a canvas-backed, separate edition, in a form which will enable them conveniently

to be handled. These will be placed on sale, together with a series of pamphlets covering matters of interest to the miners, but not of original, scientific value.

The asbestos deposits lying in Ilocos Norte along the flanks of the central mountain range and extending almost due north and south for a distance approximately of 30 miles, constitute a mineral deposit of sufficient importance to be mentioned, although no member of the bureau has as yet had opportunity to visit it, so that the information is not original. This occurrence was known to the Spaniards before American occupation and mention has been made of it in previous reports. This asbestos is probably in part of the chrysotile variety. It occurs in veins in serpentine and in less completely altered peridotites, the veins being from 2 to 10 inches wide. The fiber is in part silky and is from 1 to 8 inches long. Magnesite is also present in considerable quantities. This source of asbestos is sufficiently close to the sea to insure a fairly small outlay for transportation to points where coastwise steamers stop, and labor, timber, and water are reported to be reasonably cheap. The economic geology of Ilocos Norte constitutes another important feature for future work, which in time will need to be developed.

The chief of the division of mines has begun a series of studies on the volcanoes of the islands and during the year has visited Taal and Canloan volcanoes, the latter being partially in eruption at the time. As opportunity occurs we will continue to gather material in this branch of geologic investigation until it is ready for publication. An interesting description of the volcanoes might readily be prepared at the present time, but in respect to completeness this would be of little value. For example, the region covered by Taal volcano probably extends from the seashore at Batangas to Laguna de Bay. This area is a very large one and therefore any understanding of the life history of the volcano would involve a study of great magnitude, as an examination of the present crater readily reveals the fact that it is only an incident in the history of the whole.

The important question of an adequate space for the mining division, the fundamental importance of a place systematically to group and to begin the collection of specimens typifying the mineral resources of the islands and the geologic and paleontologic material which is accumulating, has been pointed out. The initial cost of a wing to the building would not be very great and from a business standpoint it is believed that the loss due to inadequate quarters and the inability properly to expand to meet future needs will outweigh by far the interest and deterioration on a reasonable investment.

I am, very respectfully,

PAUL C. FREER,

Director of the Bureau of Science.

The SECRETARY OF THE INTERIOR,
Manila, P. I.

NOTE.—An appendix containing the following tables accompany this report and are on file in the War Department, where they may be consulted:

Statement of free and cash work performed and supplies sold, by months, for the fiscal year 1906.

Financial statement, July 1, 1905, to June 30, 1906.

Journal of Science, debits and credits for the period from November 1, 1905, to June 30, 1906.

Value of outside work done.

Number of examinations made.

APPENDIX E.

REPORT OF THE DIRECTOR OF LANDS.

MANILA, P. I., *August 10, 1906.*

SIR: I have the honor to submit the annual report of the bureau of lands for the fiscal year ended June 30, 1906.

The last annual report covered a period to August 31, 1905, and this report therefore duplicates the report of the work performed during the months of July and August, but as so little was accomplished during these months the duplication is not herein detailed.

Shortly after assuming control of this bureau, November 1, 1905, I found that no definite organization had been effected, and employees were used wherever required with little regard to their qualifications for the different kinds of work. The chief of the bureau had been absent, either on special duty or sick, for the greater portion of the year, leaving subordinates to accomplish as much as possible with the available employees. A reorganization appeared necessary, and accordingly a division organization was instituted along the lines of the natural character of the work, and the following divisions were organized: Division of public lands; division of friar lands; division of surveying and drafting; division of San Lazaro estate.

Definite assignments of employees to these divisions were made, and each division was placed under a chief, who was held responsible for the work of the division. This organization has been found to be effective and will be continued, each division having its specific duties to perform. The duties of the chief clerk, record clerk, bookkeeper, and property clerk have also been defined and systematized. In order to perfect this organization many changes were necessary, both in the duties of the employees and in the personnel, and many of the former employees were dissatisfied and left the service, and have been replaced by new ones. This reorganization tended to retard the general results obtained to some extent.

The former chief of the bureau, Mr. Will M. Tipton, resigned on account of poor health, and Mr. J. R. Wilson, former clerk of the court of land registration, was appointed assistant director. This selection was a fortunate one, as the work of this bureau and of the court of land registration is in many respects coordinate, and this appointment greatly facilitates the work of both bureaus.

The former quarters of the bureau were found to be inadequate for the work, and the increased personnel and new quarters on the third floor of the Oriente building were assigned to, and occupied by, the bureau in the month of January, 1906.

An account of the work accomplished during the year, and recommendations, are hereafter stated under the natural subheads to which they refer, followed by a financial statement of the bureau.

FRIAR LANDS.

The work begun on the fifteen friar lands estates during the latter part of the previous fiscal year has advanced rapidly, notwithstanding the many obstacles encountered, mention of certain of which were made in the last annual report covering this subject.

Pursuant to the agreement and contract entered into with the Philippines Sugar Estates Development Company (Limited), the said corporation conveyed to the Government the following-named estates: Biñan, Calamba, Lolombo, Santa Cruz de Malabon, Santa Maria de Pandi, and Santa Rosa on October

19, 1905, and the Naic and Orion estates on October 20, 1905. By the transfer of these estates the Government came into possession of all the so-called friar lands estates, as specified in the four executory contracts entered into with the four different corporations on December 22, 1903.

As was the case with the fifteen estates transferred during the previous fiscal year, the deeds of these last-named estates were immediately recorded in the bureau upon receipt of same. In addition to this record the bureau, in accordance with provisions of act No. 1120, proceeded to register these estates with the register of deeds in each province where said estates were located.

Preparation was also made for the registration of the estates in the court of land registration, but as this registration depends upon the surveys the San Jose estate in Mindoro is the only estate for which application has been made to the land court. Similar action will be taken in the immediate future for the registration of the San Marcos, Binagbag, Dampol, and Guiguinto estates, which will be followed by the other estates as soon as the surveys can be completed.

A tabulation of the estates purchased, their location, the grantors, the date of conveyance, area, and the purchase price is here given.

Estate.	Province.	Grantors.	Date of deed.	Area.	Purchase price.
				<i>Hectares.</i>	
Banilad.....	Cebu.....	Cia. Agricola de Ultramar..	Oct. 26, 1904	1,925.00.00	P 211,999.52
Binagbag.....	Bulacan..	do.....	Oct. 24, 1904	294.75.00	35,872.76
Bifnan.....	Laguna..	Philippines Sugar Estates Development Co.	Oct. 19, 1905	3,659.00.00	601,583.18
Calamba.....	do.....	do.....	do.....	13,673.00.00	1,385,443.29
Dampol.....	Bulacan..	Cia. Agricola de Ultramar..	Oct. 24, 1904	928.93.00	150,647.56
Guiguinto.....	do.....	do.....	Oct. 26, 1904	945.68.40	155,567.88
Imus.....	Cavite....	British-Manila Estates Co.	Feb. 6, 1905	18,243.00.00	2,072,024.30
Isabela.....	Isabela..	Cia. Agricola de Ultramar..	Oct. 24, 1904	19,891.00.00	319,716.02
Lolomboy.....	Bulacan..	Philippines Sugar Estates Development Co.	Oct. 19, 1905	5,177.49.00	973,241.21
Malinta.....	do.....	Cia. Agricola de Ultramar..	Oct. 24, 1904	3,574.00.00	440,421.32
Matamo.....	do.....	do.....	Oct. 26, 1904	11.80.00	1,682.18
Muntinlupa.....	Rizal....	do.....	Oct. 24, 1904	2,827.00.00	87,677.06
Naic.....	Cavite....	Philippines Sugar Estates Development Co.	Oct. 20, 1905	7,624.00.00	982,711.53
Orion.....	Bataan..	do.....	do.....	916.00.00	98,050.33
Piedad.....	Rizal....	Cia. Agricola de Ultramar..	Oct. 24, 1904	3,860.00.00	330,343.44
S. F. de Malabon..	Cavite....	do.....	Oct. 26, 1904	11,449.00.00	1,069,874.82
San Jose.....	Mindoro..	Recoleta Order.....	Oct. 4, 1904	23,266.00.00	597,564.14
San Marcos.....	Bulacan..	Cia. Agricola de Ultramar..	Oct. 26, 1904	87.42.00	12,324.78
S. C. de Malabon..	Cavite....	Philippines Sugar Estates Development Co.	Oct. 19, 1905	9,795.00.00	1,037,412.43
S. M. de Pandi.....	Bulacan..	do.....	do.....	10,342.00.00	1,054,637.31
Santa Rosa.....	Laguna..	do.....	do.....	5,470.00.00	910,234.72
Tala.....	Rizal....	Cia. Agricola de Ultramar..	Oct. 24, 1904	6,696.00.00	224,108.66
Talisay-Minglanilla	Cebu.....	do.....	do.....	8,020.00.00	1,107,786.96
Total.....				158,676.07.40	13,860,925.40

It was the original intention of the bureau to place agents upon nearly all of the estates purchased, but it was found that combinations could be effected whereby ten agents could perform the necessary work, and accordingly, for the twenty-two estates actually administered, San Jose estate having no occupants and therefore not needing an agent, offices were established as shown by the following statement, which also shows location of office, number and name of estates administered, areas, and date of lease:

Station of agent.	Number of estates administered.	Estates.	Area.	Total area administered.	First lease executed.
			<i>Hectares.</i>	<i>Hectares.</i>	
Cebu.....	2	Banilad.....	1,925.00	9,945.00	Dec. 12, 1905
		Talisay-Minglanilla.....	8,020.00		Dec. 13, 1905
		Binagbag.....	294.75		Sept. 18, 1905
		Dampol.....	928.93		July 31, 1905
		Guiguinto.....	945.68		Aug. 2, 1905
Bocaue.....	7	Lolomboy.....	5,177.49	17,788.07	Dec. 27, 1905
		Matamo.....	11.80		July 31, 1905
		San Marcos.....	87.42		Oct. 17, 1905
		Pandi.....	10,342.00		Dec. 9, 1905

Station of agent.	Number of estates administered.	Estates.	Area.	Total area administered.	First lease executed.
			<i>Hectares.</i>	<i>Hectares.</i>	
Biñan.....	3	Biñan.....	3,659.00	11,956.00	Dec. 11, 1905
		Santa Rosa.....	5,470.00		Dec. 16, 1905
		Muntinlupa.....	2,827.00		Oct. 28, 1905
Polo.....	3	Malinta.....	3,574.00	14,130.00	July 18, 1905
		Piedad.....	3,860.00		July 20, 1905
		Tala.....	6,696.00		July 19, 1905
S. F. de Malabon.....	2	S. F. de Malabon.....	11,449.00	21,244.00	Apr. 10, 1905
		S. C. de Malabon.....	9,795.00		Nov. 21, 1905
Calamba.....	1	Calamba.....	13,673.00	13,673.00	Dec. 7, 1905
Imus.....	1	Imus.....	18,243.00	18,243.00	Apr. 28, 1905
Gamu.....	1	Isabela.....	19,891.00	19,891.00	Jan. 11, 1906
Nalc.....	1	Nalc.....	7,624.00	7,624.00	Jan. 10, 1906
Orion.....	1	Orion.....	916.00	916.00	Jan. 22, 1906
Total.....	22		135,410.07	135,410.07	

The actual work of leasing on all but two of the estates began during the fiscal year just closed, and the leasing has been pushed as rapidly as practicable.

The rates for rental were fixed not so much with a view to obtaining revenue as of obtaining primarily the attornment of the occupants, and while the rates in most cases are lower than those formerly paid to the friars, yet if a large proportion of the area of each was occupied it is believed that the income would be sufficient to pay the interest on the bonds and the cost of administration.

By the consolidation of the work of administration in the manner above outlined the cost has, it is believed, been reduced to a minimum. Nevertheless, still further retrenchments are contemplated, such as replacing American agents in some cases by Filipino agents, which has already been accomplished on the Orion estate and is contemplated upon the Isabela estate.

The following tabulated statement shows in concise form the progress made during the past fiscal year in leasing, the annual contracted rental, and the revenue collected:

Estates.	Number of approved leases.	Total area leased.	Annual contracted rental.	Total revenue collected.
		<i>Hectares.</i>		
Banilad.....	568	644.89.60	₱3,409.44	.....
Binagbag.....	188	167.17.28	702.16	₱349.68
Binan.....	1,604	1,979.64.00	19,248.64	5,800.00
Calamba.....	1,200	1,784.51.75	14,925.72	6,506.66
Dampol.....	321	964.34.28	4,309.88	3,442.40
Guiguinto.....	405	860.41.02	5,926.68	5,307.10
Imus.....	3,161	4,256.65.25	25,999.02	17,833.98
Isabela.....	53	66.37.00	901.72	.....
Lolomboy.....	1,729	2,019.65.62	13,257.72	5,395.20
Malinta.....	934	1,218.90.76	7,183.70	4,317.72
Matamo.....	1	11.80.00	68.00	68.00
Muntinlupa.....	379	365.47.24	997.42	357.09
Nalc.....	970	2,382.35.44	22,628.90	9,162.14
Orion.....	400	722.22.60	5,020.40	2,718.34
Piedad.....	378	525.87.81	2,692.12	1,552.18
S. F. de Malabon.....	1,418	2,726.10.68	18,509.06	14,872.43
San Jose.....				970.00
San Marcos.....	1	87.42.00	349.68	349.68
S. C. de Malabon.....	900	1,325.16.09	10,720.16	4,943.56
S. M. de Pandi.....	1,730	3,551.21.00	19,018.83	4,886.01
Santa Rosa.....	1,179	2,666.10.40	22,215.80	8,561.99
Tala.....	349	341.02.52	2,092.96	1,267.14
Talisay-Minglanilla.....	902	957.85.94	5,707.46	.....
Total.....	18,770	29,625.18.28	205,885.47	98,661.30

From the preceding tabulated statement it will be noticed that but one estate, the San Jose, has not been at least partially leased, and thus far the only revenue collected has been from the grazing privileges to the Recoleta friars, who pay 20 centavos per month per head for all animals two years of age or upward. There are so few occupants or settlers on this estate that from an economical standpoint the appointment of an agent would not be justifiable. However, a

prospectus has been prepared showing the location of this estate, its conditions and its advantages, with a view of its sale, and several copies have been distributed to interested parties.

The collection of revenue has begun on all but three of the estates during the fiscal year, viz, the Talisay-Minglanilla, Baniad, and Isabela estates. This noncollection of rent has been due, in the case of the first two named estates, to the fact that the work of leasing was unduly retarded by reason of the many obstacles encountered. The collections could therefore not be begun until the first quarter of the ensuing fiscal year, while in the case of the Isabela estate the rent is payable semiannually and has not yet fallen due.

The difficulties encountered in leasing, mention of which was made in the last annual report, in no wise abated nor became less numerous as the work progressed. On several estates the settlers and occupants exhibited no disposition to avail themselves of the privileges granted, and argument and explanation proved unavailing. In some instances it was necessary to appeal to the executive secretary to direct municipal officials to assist in this work, and it was found necessary to set a time limit upon recalcitrant occupants in which they could rent their land on certain estates before they would come forward and attorn to the government. It may be said that some of these difficulties encountered can be traced directly to various parties who, with but trifling, if any, interest at stake, profited by the results of the strife stirred up by them. Family and personal contentions have also been the source of annoyance and delay in the prosecution of work, and on some of the estates the opposition of the municipal officers greatly retarded the work. Most of these difficulties have now been overcome, and the municipal officials are lending every assistance possible to the employees of the bureau, with a result indicating that the general opposition has been broken, and this applies to all of the estates.

Many legal difficulties have been encountered in the leasing of the estates, and this office has been in almost continual consultation with Messrs. Del Pan, Ortigas, and Fisher, the government attorneys, who have promptly settled the greater portion of the legal difficulties. There may be mentioned, however, as unsettled the following cases:

Reserved lands.—Under the provisions of the friar-land act, a joint survey of the lands reserved by the Philippines Sugar Estates Development Company (Limited) was to be made and an agreement reached, if possible, as to the boundaries and areas of reserved parcels, and there are two cases in which an agreement has not been reached, viz:

A town lot on the Santa Rosa estate, which the company claims was sold to Mr. A. Kauffman during the month of July, 1903, containing an area of 912.52 square meters. This lot was not mentioned in either the preliminary contract or in the deed of October 19, 1905. The attention of the Philippines Sugar Estates Development Company (Limited) was called to this matter, and in explanation the representative of the company stated that the failure to exclude said lot had been due to an oversight, but that the area of the same would be deducted from the 200 hectares of agricultural land which had been reserved on this estate. It was found that the actual area, according to a survey made, was 1,530.4 square meters instead of 912.52 square meters, alleged to have been sold. The bureau has proposed that the value of this lot be agreed upon as 50 centavos per square meter and that the value of the 200 hectares of agricultural land which has been reserved by the company be agreed upon as ₱350 per hectare and that the Philippines Sugar Estates Development Company (Limited) be allowed to retain the Kauffman lot by excluding from the reserved land a sufficient area to make up for the value of the lot; but they have not replied to this proposition.

Another controversy over reserved land is the question of the grounds around the hacienda building in Santa Rosa. When the survey was made, not only was the land inclosed within the stone wall set aside, but the ground on two sides of the building extending out to the street line was likewise included. The municipality of Santa Rosa made a claim that this ground was not and never had been a portion of the hacienda property, but had been used by the municipality as a market place and as a part of the plaza for many years, which is believed to be a correct statement of the case, and the matter has been referred to the attorneys for legal action.

With these two exceptions the boundaries and areas of reserved lands have been agreed upon.

Calamba machinery case.—On taking charge of the Calamba estate it was found that certain parties claiming to act under authority from the Philippines

Sugar Estates Development Company (Limited) had been, and were at that time, removing and disposing of machinery and other appurtenances belonging to the six sugar mills formerly located on said estate and had even torn down and removed the materials of the buildings appertaining to these mills. An investigation was made by the agent of the estate and statements secured from reliable persons, from which it was definitely established that the dismantling and disposing of the said materials had taken place subsequent to the execution of the preliminary contract on December 22, 1903.

According to the above-mentioned contract, among other things the Philippines Sugar Estates Development Company (Limited) bargained and agreed to the following:

"This sale and conveyance shall include all the dwelling houses, camarines and other buildings, irrigation works, dams, tunnels, ditches, and all other improvements, together with all water rights and all hereditaments belonging to the company on every part of the estate hereby agreed to be conveyed."

In pursuance of the foregoing, on October 19, 1905, a conveyance was made by the duly authorized representative of the said company, containing the following clause:

"I also record that in this conveyance to the government of the Philippine Islands, which is subrogated thereto, are included all rights and actions which the corporation by me represented has now or may legally have in and to all buildings and irrigation works, together with all water rights, town lots, and other improvements and hereditaments existing in and on the hacienda by these presents sold."

It will be noted that the above clause of the deed omits the phrase "and all other improvements" found in the contract, but this omission is deemed immaterial, since the property described in the two documents is identical.

A demand was thereupon made on the representative of the company to restore the said mills to the condition in which the same should have been found by the government, or in lieu thereof to indemnify the government in the sum of ₱50,000, the estimated value of these mills having been placed at ₱42,000. Replying to this demand, the said representative of the company alleged that by the deed to the government the said mills were not included in the sale.

The entire matter was thereupon submitted to the attorney-general for an opinion as to whether or not such mills had been so excluded or were, or should be, the property of the insular government. The attorney-general, on March 3, 1906, held as follows:

"It is my opinion that the title to the machinery and implements in question is vested in the insular government; that the Philippine Sugar Estates Development Company is liable to the insular government for whatever damage the insular government may have sustained from the dismantling of the six mills subsequent to the contract of sale of December 22, 1903; and that, upon failure to restore such property to the government upon demand, said company will be liable for its full value in the situation in which it was at the time of its removal from the estates."

Upon the receipt of the opinion of the attorney-general this entire matter was transmitted to the attorneys for the government for action and, so far as this bureau has knowledge, is still pending settlement.

Malinta land claims.—Early in the month of December, 1905, the agent for the Malinta estate transmitted to the bureau certain documents dating as far back as the year 1713, presented to that office by one Maria Serrano, purporting to be title papers to certain parcels of land lying within the boundaries of the Malinta estate. These documents were submitted to the attorneys for the government for report as to their validity. A survey, to ascertain the exact location of said parcels of land with relation to the boundaries of the Malinta estate, was ordered, and accordingly made, and it was definitely established that one of the said parcels was situated within the estate.

The preliminary report of the attorneys for the government was to the effect that the documents were to all appearances authentic. An investigation was thereafter made by them, as a result of which a second report was rendered, to the effect that the documents exhibited by certain of the claimants, in whose behalf Maria Serrano had originally made claim, were apparently authentic and of ancient origin; that "informacion posesoria" proceedings had been instituted and the lands recorded in accordance therewith in the Registro de

la Propiedad for Bulacan Province in the year 1894; but that the descriptions of the boundaries of the said parcels were so vague in character as to render positive identification difficult. The attorneys were of the opinion that title to the said lands could not be established beyond question of doubt, but, on the other hand, could find no record of the claimants having at any time recognized the ownership of the friars or paid rental for the use of the lands, notwithstanding a continuous occupancy for many years. It was therefore recommended that no action be taken in the matter at the present time, the question being left in abeyance until such time as application should be made to the court of land registration for the confirmation of the government's title and that at such time these claimants be cited to appear before said court and produce such documentary and other evidence as they may possess, the court being then called upon to pass upon the validity of their documents and claims.

Such is the status of the case to-day, no further action having been taken by the bureau in pursuance of the above recommendations.

The superficial area of the land leased and the revenue derived through the execution of temporary leases on the basis of reports would appear to be quite unsatisfactory from a financial point of view. Such is unquestionably the case, but the object of the execution of these temporary leases should not be lost sight of, viz, attorning by the occupants for the land occupied, and this object has been attained in a highly satisfactory manner. It should also be borne in mind that this bureau entered upon the administration of the friar lands with but the most meager, and in most cases with absolutely no previous information at hand which might serve as a guide, this branch of the service being an entirely new departure. The securing of the names and residences of the actual bona fide settlers and occupants, together with the extent of their several holdings and the character and value thereof, have occupied a great portion of the time of the agents, and the execution of temporary leases had for its object the accomplishment of at least a part of the above-cited duties. Temporary leases have been executed in accordance with the statements made by the lessees themselves; the areas specified in such leases have been computed on the basis of the quantity of seed sown, as stated by the lessees, which varies considerably, according to the fertility of the soil and the location of the estate. The classifications of the land for the purpose of these temporary leases have also been based upon these statements, which are generally understated areas and erroneous classifications, but through the medium of these temporary leases names, residences, and other particulars have been procured concerning the actual settlers and occupants, and upon the expiration of the period of one year for which these leases have been executed the bona fides of the claims of each will have been established beyond reasonable doubt, should no counter claims have been presented, and the number of parcels of land, the relative location of each, and their approximate area ascertained. Therefore, the rental contracted for and the area leased, as mentioned in the above tabulation, has no particular significance and is only a foundation upon which, in the future, all proceedings must be based, it being the correction and elaboration of this work that will engage the immediate future of the friar land agents in connection with the actual service.

On certain of the estates temporary leases heretofore executed have begun to expire and lapse, and where the survey work has progressed to such an extent as to enable so doing such temporary leases will not be renewed, but new leases, embodying accurate particulars, will be executed in lieu thereof.

In order that, when the time arrives for the sale of any of these estates, a formula for obtaining the value for sale should be ready, the following proposed method of obtaining the sale value of the friar lands was submitted on March 6, 1906, and approved by the secretary of the interior and the governor-general:

"Section 12, act No. 1120, reads:

"It shall be the duty of the chief of the bureau of public lands, by proper investigation, to ascertain what is the actual value of the parcel of land held by each settler and occupant, taking into consideration the locality and quality of each holding of land and any other circumstances giving it value. The basis of valuation shall likewise be, so far as practicable, such that the aggregate of the values of all the holdings included in each particular tract shall be equal to the cost to the government of the entire tract, including the cost of surveys, administration, and interest upon the purchase money to the time of sale."

"In order to obtain selling value of each parcel of land held by an occupant the following method is suggested:

"1. Obtain purchase value of each estate by adding to the actual amount paid to the former owners the following:

"(a) The cost of preliminary surveys.

"As such cost was not segregated as between the estates by the surveyors no definite data were kept, and the cost to each estate is obtained by segregating among the estates the total cost of such surveys in proportion to the area of each estate surveyed.

"(b) Attorneys' fees.

"Special attorneys were employed to pass on the titles of these estates, and the cost of such attorneys should be added to the cost of purchase in proportion to the respective value of the estates purchased.

"(c) Other expenses.

"Incidental to the purchase of these estates are the expenses of registration of each estate in the provinces. No attempt is made to add to the cost of the estates administration charges for work done prior to the date of actual possession, either of the bureau of lands or of other government offices having performed services incidental to the purchase.

"2. To obtain purchase value of land as distinct from the purchase value of the estate:

"(a) Obtain estimate of present value of all buildings and structures belonging to each estate.

"(b) Obtain estimate of present value of the irrigation system belonging to each estate.

"(c) Obtain estimate of present value of all other improvements on each estate.

"The sum above will give the present value of all improvements on each estate, which values are assumed to be the values of improvements at the date of purchase, and if deducted from the purchase value of each estate will give the purchase value of the land.

"3. Obtain the area of land on an estate which is not subject to sale, such as roads, plazas, water ways, reserved land for schools, markets, or other public places, and deduct same from total area of the estate, which will leave the area subject to disposal. Thus we have the purchase value of the land on each estate (see sec. 2) and the area of the land subject to disposal (see sec. 3.)

"4. To obtain selling value of land subject to disposal on each estate add to the purchase value of all the land.

"(a) Interest at the rate of 4 per cent per annum from date of purchase to date of sale, said date of sale to be fixed as the first day of a quarter of a calendar year after said estate is ready for sale.

"(b) Cost of land surveys of the estate by the surveyors of the bureau of lands and a proper proportion of the expenses of the surveying and drafting division of the bureau of lands.

"(c) Cost of administration of each estate pertaining to the land. (The total cost of administration of an estate includes cost of administration of both land and improvements.)

"Subsections (b) and (c) are obtained from the cost register of the bureau of lands which is being kept, wherein a proportion of the general expenses of the bureau of lands and its various divisions is charged off against the friar lands administration semiannually, according to the proportion of work pertaining thereto.

"The result thus obtained is the selling value of the land subject to disposal.

"5. After surveys are completed and area of each parcel obtained, each separate parcel of land on an estate will be classified according to its location, its use, adaptability, productiveness, nature of the soil, whether irrigated or not, and such other facts as may affect its value. The area multiplied by the class value per unit will thus give the value of each parcel, and the aggregate of these amounts will equal the selling value of the lands subject to disposal.

"6. The purchaser of each parcel of land to be charged therefor according to the classification and the value as above obtained, less the rent which has been paid by such purchaser, provided that the rent he has paid pertains to the parcel of land he purchases. This is necessary on account of the fact that many purchasers will have paid rent for either greater or less areas than they will purchase. Some will purchase without having paid any rent. Others will have paid rent not in accord with the classification of their lands, and it is believed that it is the only way that equity may be obtained in the sale value of the land.

"7. If all the lands of the several estates were thus disposed of, there would

remain the improvements, the value of which would be the estimated value of improvements (sec. 2), the value of the land occupied by same, plus 4 per cent per annum on said value to any given date, plus a proportionate share of the cost of administration.

"The cost of administration after the date of sale should be borne by the purchasers and the lessees, and it is believed that the difference between the 4 per cent interest on deferred payments compounded annually and the rate actually paid by the government, resulting from the premium on the bonds, plus the interest which may accrue on amounts deposited to the credit of the friar lands funds in excess of the actual interest rate paid by the government on the bond issue, plus rent on lands not sold and rents on improvements, will be sufficient to cover the cost of this administration."

The preparation for sale of some of the estates has already so far progressed that it is probable that the following estates will have been disposed of by the 1st of January, viz, Matamó, San Marcos, Binagbag, Dampol, and Guiguinto, the surveys of which are completed. These should be followed in the second half of the fiscal year by the final disposition of the Orion estate and beginning of the sale of the Biñan and Santa Rosa estates.

On six estates, viz, Calamba, Biñan, Imus, Naic, Lolomboy, and Talisay, buildings of various kinds have been found pertaining thereto, but owing to years of abandonment, with the consequent deterioration caused by the elements and the dismantling by vandals, almost without exception these buildings are badly in need of more or less extensive repairs. Repairs of a minor nature have been made during the past year, and an estimate has been submitted to the bureau of engineering for further repairs. In three instances, viz, Calamba, Naic, and Imus, the buildings have been rented to the military authorities upon a basis to secure interest on the capital invested. On the other estates the buildings are occupied and used by the bureau for its agents. The eventual disposition of these buildings will be a subject for consideration during the ensuing year and recommendations made thereon.

Upon the following-named estates, viz, Imus, San Francisco de Malabon, Santa Cruz de Malabon, Naic, Calamba, Santa Rosa, Biñan, and Lolomboy, are to be found irrigation systems far-reaching in extent. On a number of the above-named estates the dams that have been erected in former times are of gigantic proportions and regulate the water supply for thousands of hectares of the best lands. Such irrigation facilities as exist on the remaining estates are of minor importance and merit no particular note.

As is the case with the buildings, a correct or even approximately correct valuation of the larger dams would be difficult to ascertain with any degree of accuracy at the present time. An estimate only is possible for reasons heretofore expressed. As a general rule, these major works are in a comparatively good state of preservation, a few only requiring repairs of a costly or extensive nature.

A large number of small secondary dams are to be found on the various estates, and these were found to be in most cases in a deplorable condition, requiring immediate attention and the expenditure of considerable sums in repairs. However, taking into consideration the years of total neglect, the cost of repairs already effected and hereafter to be made can not be considered as excessive.

The tunnels leading from the main dams, of which there are a number of great size and length, were found to be completely filled and choked to such an extent as to render the passage of water no longer possible in any volume, great or small. This same condition of affairs was found to exist in almost every main canal and even minor ditches on every estate, the accumulated silt of years impeding the passage of the water.

The distribution of the water, formerly under the direct control and supervision of the friars, during recent years has been in the majority of instances assumed by the various municipalities, this service being administered after a fashion under such regulations as they had seen fit to adopt.

On September 13, 1905, a competent and experienced man was employed to take charge of the distribution of the water on the various estates, to oversee the cleaning of the canals and ditches, and to superintend the making of minor repairs on irrigation works of every description. Under the direction of this superintendent and the various agents a number of "celadores," or ditch tenders have been employed on each estate to enforce compliance with the regulations established for this important branch of the administration.

The bureau of public works was requested to repair the irrigation works on some of these estates and has made repairs of a considerable extent, and the employees of this bureau have completed many of the minor undertakings requisite for the reestablishment of the various irrigation systems, placing the same again on an effective and serviceable basis. This work, however, may be said to have but begun, as the destruction wrought during the years of abandonment has been most widespread and far-reaching in effect, and it will require constant and intelligent work for a long time to come to again fully rehabilitate these once effective irrigation systems.

During the early part of the year last past the soil physicist of the bureau of agriculture examined and reported upon conditions prevailing and quality of the soils found on the following-named ten estates, viz: Imus, San Francisco de Malabon, Malinta, Tala, Piedad, Dampol, Guiguinto, Binagbag, Matamó, and San Marcos. This report shows a considerable variation in the soils and conditions on the various estates as compared one with the other, but as a general rule the conditions and qualities of soil prevailing throughout an entire province are similar. All estates found within any particular province seem to partake of the same general conditions and be subject to the same general classifications as regards productiveness and fertility of soil. This report will be of great value and assistance when the time arrives for the final classification and sale of the lands of the different estates.

The survey parties on the various estates have carried on the work commenced by the soil physicist. Borings are made at regular intervals as the surveys progress and a record kept of the depths of soil encountered at the different points, which will enable an intelligent classification and appraisement at the proper time.

On only a few of the estates (and those few are of the smallest and of least importance) has it been found that the lands are being cultivated or held to anything like the extent to which the same are susceptible of cultivation. On practically all of the larger estates, almost without exception, vast stretches of country, thousands of hectares in extent, which once were under a high state of cultivation, principally to sugar cane, now lie fallow and entirely abandoned. No one works this fertile land; no one is desirous of leasing it, for the reason that they would be unable to work it.

This lamentable state of affairs is attributable, for the greater part, to the dearth of animals with which to cultivate the soil. Coupled with this is the impoverished condition of the inhabitants themselves as the result of the events of the past few years, and as a consequence thereof these lands have laid idle, becoming overgrown with a dense growth of "cogon" grass or underbrush, to clear which would require a large capital. This necessary and indispensable capital is unprocurable.

The unsettled political conditions prevailing, involving the hazardous position in which one's life and property interests are placed when distant from the populous centers, have contributed in great measure to the reluctance of the people toward clearing new lands and assuming pecuniary responsibilities other than those they must necessarily shoulder.

In accordance with the appropriation act (No. 1416) the accounts of expenditures made by this bureau on account of the friar lands have been kept separate. These accounts have also been segregated in such manner as to show the actual cost of administration, survey, and irrigation of each estate. The methods used to obtain these figures have been, primarily, to charge against each estate the cost of the work actually performed and other expenditures incurred. Second, to charge the expenses of a friar-land office handling several estates to the estates in proportion to the cost of the estate at the date of purchase. Third, to charge the expenses of the friar-lands division of the bureau to the estates proportionately, according to the cost of each estate. Fourth, by charging 60 per cent of the general expenses of the bureau to the friar lands and 80 per cent of the expenses of the surveying and drafting division of the bureau to friar lands.

The following statement showing the expenditures for the friar-lands estates for the fiscal year 1906 may be said to be as near accurate as can be obtained: ^a

^a Statement showing expenditures for each estate accompanies this report and is on file in the War Department.

Summary.

	Administra- tion.	Surveying and drafting.	Irrigation.	Total.
Salaries and wages.....	P64,895.69	P66,382.45	P5,263.82	P136,541.96
Supplies.....	2,076.60	12,846.26	461.43	15,384.29
Transportation.....	2,588.44	2,920.69	294.90	5,804.03
Miscellaneous expense.....	3,908.16	642.23		4,550.39
Per diem.....	1,513.00	773.00		1,286.00
Furniture and fixtures.....	5,410.04			5,410.04
Printing.....	3,263.37			3,263.37
Total.....	83,655.30	83,564.63	6,020.15	173,240.08

PUBLIC LANDS.

Since the last annual report was submitted, there has been greater activity relative to public lands than at any previous time since the establishment of the bureau. Many circulars had already been distributed prior to July 1, 1905, and this work has been continued during the fiscal year 1906, during which time about 52,000 pamphlets and circulars, in various languages and dialects, covering every feature of the public land laws, have been prepared, printed, and distributed.

On October 13, 1905, the Philippine Commission passed act No. 1404, providing that provincial treasurers shall act as local land officers. This greatly facilitates the administration of the public land laws and enables applicants to personally appear before the local land officers and have their applications intelligently prepared. Provincial treasurers have been furnished circulars, pamphlets, and instructions for distribution in the municipalities of their respective provinces.

In addition to the ordinary literature relative to the land laws, there has also been printed and distributed a public land primer, which, it is thought, has done more to instruct the people at large in the workings of the land laws than any other pamphlet. It has been the endeavor in this primer to ask and answer such questions as ordinarily arise in the minds of persons unfamiliar with the provisions of the law.

Homesteads.—The total number of homestead applications on file in the bureau, June 30, 1906, was 805, of which 578 were received during the last fiscal year. One reason why more homestead applications have not been received is that the very nature of the homestead presumes the taking up of unoccupied public lands. The hereditary custom of the Filipino to stay near his birth-place, together with the depressed condition of finances, which precludes the possibility of purchasing necessary work animals were the same available, deters most people from entering upon lands when they can not see their way clear to fulfilling the requirements of the law. Another reason is that the Filipino prefers to live in barrios or small villages for mutual protection and social advantages, and generally dislikes to change residence to the more lonely surroundings made necessary by a compliance with the homestead law. Also the majority of Filipinos can work the lands of large haciendas on a share system, and have no desire to go to the extra trouble and expense of clearing and cultivating new lands, which would be necessary in the case of homesteads.

Another feature which has interfered with the presentation of homestead applications is the fact that so few of the persons who wish to avail themselves of the provisions of the law are able to perform the clerical work necessary to fill out the application. Instances are known where persons have been charged exorbitant fees for having such applications prepared, and this is a burden which the applicant can ill afford in addition to the regular fee of 10 pesos. It is believed, however, that this feature has been corrected to a great extent by the resolution of the Philippine Commission directing municipal secretaries to make out such applications free of charge, but the question naturally arises as to whether or not the municipal secretaries will properly perform the duties thus placed upon them.

The mere fact that a person has applied to enter land as a homestead does not, in many cases, signify that the land he solicits is public land and subject to the provisions of the law. In quite a number of cases it has been found that squatters on large haciendas have filed homestead and free patent applications.

laboring under the idea that by so doing they would acquire certain rights in the property sufficient at least to defeat the title of the rightful owner of the land. This is a point that can not be settled until such time as the registration of all private holdings in the court of land registration is made compulsory and the time limit for such registration has expired.

Of the 805 homestead applications entered up to June 30, 1906, 180 were allowed during the year, 106 were rejected, 12 were withdrawn, and the remainder have not yet been reached for action. Fees to the extent of ₱2,270 were received.

Sales.—There were 62 applications received for the sale of public land during the fiscal year, of which 3 were rejected, 10 withdrawn, and 1 canceled, the remainder pending action. Thirteen sales were advertised during the year, but as yet no actual sales have been made. The majority of these applications are for small tracts of land.

Leases.—There have been but 5 applications to lease public land received during the year, but no actual leases have been issued.

It is known that large tracts of public land are being occupied by individuals who have made no application to enter such lands. This is especially true on the island of Mindanao, where for some years parties have been petitioning that the public-land laws be extended to said island in order that they might protect their holdings, and now that said law has been applied there has apparently no effort been made to enter their lands.

It is the intention of the bureau to send public land inspectors to different parts of the islands to investigate the occupation of public lands, and it is hoped to induce parties occupying such lands to protect themselves against the possibilities of having their claims jumped, thus forcing them to purchase their lands at exorbitant prices when the same can be leased or purchased at the present time from the government at minimum prices.

Free patents.—The number of free patent applications received to June 30, 1906, was 730, of which 590 were received during the last fiscal year. Ninety-two applications were rejected, 20 withdrawn, and 163 returned for correction. The remainder await survey and final action.

This chapter of the public-land act appears more valuable to non-Christian people than to others, for the reason that in the majority of cases property owners in the civilized provinces can obtain title to their lands by availing themselves of Chapter VI of this act.

The principal reason for the rejection of free patent applications is that the parties presenting same have not complied with the requirements of the law as regards occupation. Also many have solicited lands which are not public domain, having applied for said lands, as in the case of homesteads, with the idea of defeating the registration of the property by the rightful owners.

The question has arisen as to whether or not an extension of time should be granted during which parties might avail themselves of the provisions of the free patent chapter. This is thought unnecessary for several reasons. In the first place, as stated above, this chapter is of more value to the non-Christian people than others. In the second place, practically all other property holders throughout the islands have been in possession of their lands for a sufficient length of time and under sufficient color of title to register their title under the provisions of Chapter VI of the public-land act; and, inasmuch as they have been notified of their rights under said chapter, such persons would suffer no hardship were the present law permitted to stand. If their properties are less than 16 hectares, it is probable that the assessed value is less than \$100 United States currency in the majority of cases; and this being true, the expense for registration in the court is ₱20, which is not too great in case the property is of sufficient value to warrant registration.

Townsites.—During March, April, and May part of the townsite of Baguio, Benguet, was subdivided into lots by surveyors of this bureau and the same were offered for sale in Baguio at public auction on May 28, 1906, at which sale 91 residence and 15 business lots were sold. The remaining lots are to be sold at auction in Manila on July 20 and it is presumed that all of said lots will be disposed of at that time. This townsite was surveyed in accordance with the plans of architect Burnham, ample provision being made for parks, streets, government buildings, churches, schools, hotels, and hospitals. Several residences are already under construction, and it now seems probable that it will be necessary in the near future to subdivide a large portion of the remainder of the townsite.

The municipal authorities of Parang, Mindanao, have also petitioned the lay-

ing out of a townsite at Parang, and surveyors are to be sent to properly lay out same in order that the sale of lots may take place as soon as possible.

Unperfected titles and Spanish grants and concessions.—As will be seen by the accompanying table, there have been 367 notices received from the court of land registration relative to applications which have been presented to said court for registration of title under the provisions of Chapter VI of the public-land act. The attorney-general has been requested to enter appearances in 97 of these cases and to enter oppositions in 54 of same. It has been found better policy to have the attorney-general enter appearance in many small and doubtful cases, in order that default may not be taken against the government rather than enter an opposition, for the reason that many persons applying for registration of title can ill-afford to pay attorney's fees and it would be an injustice to them if the government ordered oppositions to their titles rather than a simple appearance. This method of procedure has resulted in a large increase in the number of applications presented to the court during the past year and it is expected that the number of applications will continue to increase. The majority of applicants avail themselves of the provisions of paragraph 6, section 54, of the public-land act, as there are very poor facilities for them to prove their rights under the previous paragraph of said law, even if they were entitled to same, for the reason that practically all of the public-land records of the Philippine Islands were burned in 1897.

The majority of the oppositions ordered by this office were in cases where parties have attempted to secure large tracts of unoccupied, uncultivated land to which they had no right, either legal or moral. Many persons have stated in their applications that their occupation of said lands consisted in the pasturing of cattle upon same. Such claims only merit the most strenuous opposition of this bureau before the courts.

Section 61, act No. 926.—Many complaints have reached this office from various sources to the effect that persons are claiming large areas of land, the limits of which are not clearly defined. This practice is general throughout the islands, and in some provinces it is reported as being carried on by municipal officials, who claim the lands and enforce their orders by reason of their position. Other persons who have titles to haciendas have stretched the boundaries until they are many times the size of the original grant. Against these persons this bureau proposes to take action, if the same is authorized by the chief executive of the islands. The attention of several of these land grabbers has been called by the bureau to this practice and they have signified their intention to immediately present their titles to the court of land registration, and if such proceedings are begun it is deemed far better than compulsory action on the part of this bureau.

Sections 58 and 66, act No. 926—Surveys of Imperfect Titles.—As stated under the remarks of surveying, it is the desire of this office, as well as the court of land registration, that all surveys of land solicited under the provisions of Chapter VI be made by the bureau of lands or a surveyor authorized by said bureau. This desire arises from two causes. The first is that the applicant for registration of title may not be delayed in securing title by reason of second survey to be made by this office, called for in section 66. Second, where surveys are made by this bureau, under the provisions of section 66, the expense of same is a burden upon the government, for which there is no reimbursement.

There have been ordered surveyed during the past fiscal year 112 parcels, being the number of decrees received from the court of land registration. Twenty-two of said surveys have been completed and an equal number will have been completed within the next sixty days. The value of these surveys for the purpose of this bureau will not be worth a fraction of the actual cost of same, for the reason that a large proportion of same are bounded by private lands and surveys by this bureau do not furnish data for the segregation of these lands from the public domain. As time goes on the number of these surveys will increase and in the course of two or three years, on account of lack of competent surveyors, either this bureau will be hopelessly behind in the execution of this work, or else the expense for surveyors will be large. It is suggested that the law should be changed that small parcels of land bounded by private property should not be resurveyed under the provisions of said section 66.

Mining claims.—Owing to the failure of the provincial secretaries, who are mining recorders, to render their reports for the fiscal year 1906, it is impossible

to give a complete list of all mining claims filed during the said period. Those reported are as follows:

Province.	Gold.		Iron.	Lime-stone.
	Lode.	Placer.		
Ambos Camarines.....	30	18	-----	-----
Batangas.....	10	2	-----	-----
Rizal.....	-----	-----	3	1
Total.....	40	20	3	1

It is known, however, that many more claims have been located throughout the islands. It is a noticeable feature that the coal of the islands is being more seriously considered by large corporations than at any time previous in the history of the islands and, from all indications, it is thought that within a short time sufficient coal will be mined in the Philippine Islands to reduce materially the importation from foreign countries.

Many claims have been located and surveyed in the province of Cebu, and the output is to be used mainly on the railroads in the southern islands. Quite a number of claims located in the island of Batan have been allowed to lapse.

Surveys of placer claims, located by the Philippine Mining Company, which were commenced during the fiscal year 1905, have been completed.

Inasmuch as the report of this bureau for the fiscal year 1905 did not show all mining claims which were received during said period, there is attached hereto a report showing all mining claims located during the fiscal year 1905. As regards complete report for the fiscal year 1906 same will be forwarded as soon as reports have been received from all the provinces.

Mining claims reported as having been recorded during the fiscal year 1905.

Province.	Gold.		Cop-per.	Iron.	Coal.	Mar-ble.	Quar-ries, lime-stone.	Plas-ter.	Guano.	Petro-leum.	Total.
	Lode.	Placer.									
Ambos Camarines...	115	39	-----	-----	-----	-----	-----	-----	-----	-----	154
Albay.....	-----	-----	-----	-----	11	-----	-----	-----	-----	-----	11
Batangas.....	10	-----	-----	-----	-----	-----	-----	-----	-----	-----	10
Bulacan.....	-----	-----	-----	6	-----	-----	-----	-----	-----	-----	6
Cebu.....	-----	-----	-----	-----	39	-----	-----	-----	-----	-----	39
Laguna.....	-----	-----	-----	-----	-----	-----	-----	3	-----	-----	3
Lepanto-Bontoc.....	37	4	-----	-----	-----	-----	-----	-----	-----	-----	41
Masbate.....	47	10	-----	-----	-----	-----	-----	-----	-----	-----	57
Mindoro.....	-----	-----	-----	-----	10	-----	-----	-----	-----	-----	10
Misamis.....	-----	-----	2	-----	-----	-----	-----	-----	-----	-----	2
Pangasinan.....	16	-----	-----	-----	-----	-----	-----	-----	-----	-----	16
Rizal.....	-----	5	-----	-----	-----	-----	3	-----	-----	-----	8
Romblon.....	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	1
Surigao.....	1	5	-----	-----	-----	-----	-----	-----	-----	-----	6
Tayabas.....	6	-----	-----	-----	17	-----	2	-----	7	23	55
Total.....	232	63	2	6	77	1	5	3	7	23	419

The receipts from entry and sale of public lands were as follows:

Sale of coal lands.....	₱3,461. 60
Homestead fees, liquidated.....	1,200. 00
Baguio town-site sale.....	9,472. 14
Total	14,133. 74

The expenses of administering and surveying public lands were ₱46,820.76. ^a

^a Table showing same segregated is on file in the War Department.

Table showing the number of public land applications received during the fiscal year 1906, and action thereon.

	Home- steads.	Sales.	Leases.	Free patents.	Chapter VI.
Applications received.....	578	62	5	590	.....
Applications allowed.....	180				.....
Applications rejected.....	106	3		93	.....
Applications withdrawn.....	12	10		20	.....
Applications canceled.....		1			.....
Corrections requested.....	277	10	1	163	.....
Bids called for.....		9			.....
Notices received from court of land registration.....					367
Decrees received from court of land registration.....					112
Attorney-general requested to appear.....					97
Attorney-general requested to oppose.....					54
Surveys ordered.....					112
Surveys completed.....					22

SURVEYING.

At the beginning of the fiscal year the surveying force of the bureau consisted of two friar lands survey parties, one survey party on coal claims and one survey party on placer claims. Owing to the lack of available applicants for the position of surveyor, it was not until November that additional surveyors were procured, and as soon as employed they were assigned to work on the survey of the friar lands, until at the close of the year there were at work nine friar lands survey parties, consisting of 21 surveyors; one mineral claim survey party, consisting of 2 surveyors; two survey parties making surveys under the provisions of act No. 926 for the court of land registration, consisting of 2 surveyors, and one free patent survey party, consisting of 2 surveyors. The additional surveyors were employed primarily as temporary men, but many took the surveyor's examination, passed, and were given permanent employment. They were secured from every available source, and, while not all experienced surveyors, have accomplished satisfactory results.

The former chief surveyor, Mr. H. F. Flynn, was, on his own request, sent into the field in charge of a party, and Mr. S. O. Scudder was appointed acting chief surveyor on January 1, 1906. He has been engaged the greater part of his time in preparing detailed instructions for the various classes of surveys which this bureau is called upon to make, and such instructions have been issued relative to friar lands surveys, placer and lode surveys, coal claim surveys, free patent surveys, unperfected title surveys, and lease surveys. A plan has also been prepared and submitted for the preliminary work of a general survey of the Philippine Islands, but as this plan has not been approved it is not herein detailed.

The following work has been accomplished by the surveying division during the past year, in addition to the surveys of the friar lands estates:

Surveys for private parties under section 58, act No. 926:

Pangasinan Province.....	2
Tarlac Province.....	1
Masbate Province.....	1
Moro Province.....	1
City of Manila.....	12
Total.....	17

Surveys covering 608.58 hectares, at a total cost of ₱1,766.84, or ₱2.905 per hectare, of properties certified to this bureau by the court of land registration under the provisions of section 66, act No. 926:

City of Manila.....	3
Rizal Province.....	4
Zambales Province.....	1
Sorsogon Province.....	10
Cebu Province.....	3
Total.....	21

The following surveys under section 66, act No. 926, covering an area of 771.24 hectares, were made, but computations and plans have not yet been completed:

Pangasinan Province	10
Tarlac Province.....	7
Nueva Ecija Province.....	1
Ambos Camarines Province	2
Total	20

The following surveys under section 66, act No. 926, covering an area of 101.43 hectares, approximately, are in progress:

Albay Province.....	9
Nueva Ecija Province	3
Laguna Province.....	3
Total	15

One hundred and sixty-three parcels of land in Benguet Province, for which application has been made for free patent by native settlers, have been surveyed, but computations, plans, etc., are not yet completed.

Surveys, computations, and plans of 121 lots in the town site of Baguio have been made at a total cost of ₱3,715.85, including the cost of appraisement of value and other charges incidental to sale thereof.

Five placer claims, located by the Philippine Mining Company, at Aroroy, Sorsogon Province, the surveys of which were commenced in May, 1905, containing an area of 137.6272 hectares, have been completed, plans platted, and final notes written and approved. The total cost of survey, plans, and notes is ₱2,404.55.

Twelve coal claims in the province of Albay, aggregating 718 hectares, were surveyed at a cost of approximately ₱1,300. Two coal claims in Cebu Province, of 64 hectares each, were surveyed at a cost of ₱844.80.

At the request of the bureau of education 2 parcels of public land, 1 in Isabela Province and 1 in Sorsogon Province (Masbate), were surveyed for school purposes, but computations and plans have not been completed.

At the request of the secretary of the interior the government experimental farm in the district of Malate, Manila, and a parcel of land belonging to the Archbishop of Manila, adjacent to the exposition grounds, were surveyed.

In addition to the continuation of the friar lands surveys during the ensuing fiscal year, there are pending 68 surveys under the provisions of section 66, act No. 926, with the probable certification by the land court of 275 additional surveys, making a total of 343 surveys under this section.

Seventy-one coal locations have been received during the past fiscal year, surveys of which will be ordered when application therefor is made. There are also pending 12 applications for survey of lode claims. In addition, many mining claims are being located and surveys thereof will be necessary, and it is anticipated that it will be impossible to obtain sufficient surveyors to accomplish the work projected.

In order to assist the bureau in surveys under the provisions of act No. 926, it was decided to hold an examination to determine the competency of surveyors in private practice for appointment as deputy land surveyors. This examination was held in April by the bureau of civil service, in which 20 applicants in Manila and 28 in the provinces took the examination. Of these 48 applicants only 3 qualified. The questions given in this examination were of such a practical character that any surveyor making a pretense of doing accurate work should have been able to qualify without any preparation whatever. This examination indicates that it will be practically impossible for this bureau to obtain outside help on the question of surveying for the present, but the result of the examination is believed to have been a benefit to the so-called surveyors, as many of them have begun to study modern surveying as practiced, with a view to taking a reexamination in the future, and it is hoped by this method to at least get some assistance and have a few appointees as deputy land surveyors outside of the employees of this bureau.

The bureau of civil service also held in the month of April an examination for civil service surveyors, in which eleven of the temporary surveyors of this bureau participated, seven of whom were successful. This examination was much more difficult than that given for deputy land surveyors.

Only three surveyors have been appointed during the year from the Federal service in the United States, although examinations are contemplated in the immediate future, and it is hoped to secure a large list of eligibles.

A proposition was submitted to the Philippine Commission for the establishment of a practical school of instruction in surveying for Filipino students, in conjunction with the bureau of education, which resulted in the passage of act No. 1491. The director of education has informed this office that there will be five Filipino students available for certification on July 1, and it is believed that within three months a school of 15 students will be in operation in the bureau, which should result in developing Filipino surveyors. Every effort will be made to give these young men a practical education in surveying, as this appears to be the most feasible means of getting surveying done in these islands in the future at a reasonable cost.

Every effort has been made to facilitate the surveying of the friar lands, and 48,200 hectares have been surveyed to June 30, 1906, of which 24,964 were surveyed during the year. The cost of such surveys has been as follows:

Salaries and wages	₱66,382.45
Supplies	12,846.26
Transportation	2,920.69
Miscellaneous expense	642.23
Per diems	773.00
Total	83,564.63

From the following statement it appears that the survey of 24,964 hectares has cost ₱83,564.63, or about ₱3.35 per hectare, but as the work done also includes the running of advance, primary, and secondary traverse lines and sketching, which is not included, this cost is only approximate and does not include additional cost of computations and drafting.

It has been impracticable to obtain a unit cost of surveying, as conditions vary so greatly on different estates, but it is believed that as the cost of surveys on the different estates is obtained it will be possible to determine a unit cost per hectare for surveying. The large number of small parcels on some of the estates greatly increases the cost of both field work and computation, thus it has been found that in town lots a party of two competent surveyors could average 143 hectares per month, while in rice and sugar lands the same size party exceeds 175 hectares per month, and it is hoped to exceed this figure.

Progress of surveys on friar lands to June 30, 1906.

Estates.	Area.	Survey began.	Survey completed.	Area surveyed to July 1 1906.	Per cent of area surveyed to July 1, 1906.
	<i>Hectares.</i>			<i>Hectares.</i>	
San José	23,266.00	Mar. 13, 1905	Aug. 27, 1905	23,266.00	100
San Francisco de Malabon	11,449.00	June 13, 1905	Incomplete.	1,923.40	16.8
Imus	18,243.00	July 21, 1905	do	2,535.80	13.9
Dampol	928.93	Sept. 13, 1905	Feb. 5, 1906	928.9	100
Guiguinto-Alang Ylang	255.72	Nov. 21, 1905	Feb. 7, 1906	255.7	100
Malinta, detached portion	28.60	Nov. 24, 1905	Dec. 17, 1905	28.60	100
Lolomboy-Pasolo	76.00	Dec. 14, 1905	Feb. 14, 1906	76.00	100
Guiguinto-Barihan	56.65	do	Jan. 8, 1906	56.6	100
Isabela	19,891.00	Jan. 1, 1906	Incomplete.	14,908.2	75
Santa Rosa	5,470.00	Jan. 15, 1906	do	962.7	17.6
Biñan	3,659.00	Jan. 17, 1906	do	1,090.4	29.8
Guiguinto-Daquila	40.43	Jan. 22, 1906	Jan. 31, 1906	40.4	100
Binagbag	294.75	Feb. 5, 1906	Apr. 5, 1906	294.7	100
Guiguinto-Malapad	8.11	Feb. 7, 1906	Feb. 8, 1906	8.1	100
Guiguinto-Recoleta	512.34	Feb. 9, 1906	Apr. 8, 1906	512.3	100
Lolomboy-Malanday	142.00	Feb. 19, 1906	Apr. 9, 1906	142.00	100
Calamba	13,673.00	Mar. 7, 1906	Incomplete.	697.3	5.1
Santa Maria de Pandi	10,342.00	Apr. 6, 1906	do	82.7	0.8
Guiguinto-Anibon	72.43	Apr. 9, 1906	Apr. 12, 1906	72.4	100
San Marcos	87.42	Apr. 10, 1906	Apr. 24, 1906	87.4	100
Malinta	3,574.00	Apr. 13, 1906	Incomplete.	171.5	4.8
Lolomboy-Toro	59.00	Apr. 25, 1906	June 12, 1906	59.00	100
Lolomboy-Bocaua	4,901.00	June 13, 1906	Incomplete.		

^a Surveyed in 1905.

Total area surveyed to date 48,200 hectares.

Total area surveyed fiscal year 1906, 24,964 hectares.

NOTE.—Graphic charts showing the financial progress on the friar lands estates for the fiscal year 1906, areas occupied, leased and surveyed, annual interest, annual income, and administrative expenses accompany this report and are on file in the War Department.

DRAFTING.

The drafting force has been augmented during the year by the employment of several additional native draftsmen, but they have been unable to keep up with the press of work due to the large number of surveys. However, the force has been organized and is now turning out accurate work efficiently. In addition to the regular work circular letters were prepared and sent to provincial treasurers requesting that they indicate on small maps submitted to them the approximate location of occupied and unoccupied land and include a list of all haciendas of more than 300 hectares, with the names and addresses of the owners. Many of these letters have resulted in plans being received, which were reduced to a scale of 1:200,000, with a view of preparing a map of the islands showing the approximate location of public lands to be obtained by elimination. The large hacienda holders have been requested to forward to this office plans of their haciendas, and copies of such plans have been made when received and the information compiled with a view to future use in this work. The great difficulty lies, however, in the accuracy of base maps upon which to begin the work. In the island of Luzon, between Manila and Dagupan, the coast and geodetic survey has located some 250 church towers, which have been platted upon polyconic projection sheets to a scale of 1 inch to the mile, and an attempt made to adjust the inch map of Luzon, prepared by the military authorities, to these points so platted, but very great inaccuracies have been found, which would seem to defeat the purpose of obtaining anything like an approximately correct map of even the island of Luzon without further surveys.

The plans, maps, charts, etc., on hand in the bureau have been indexed and filed under a comprehensive card system, and from all offices of the insular government and military authorities plans and maps as would assist in public or private land survey work have been secured.

SAN LAZARO ESTATE.

Upon investigation of the administration of the San Lazaro estate, I found that the clerk intrusted with this work was also cashier for the bureau, and as such nearly his entire time was occupied by the handling of the funds, receipts, vouchers, and the preparation of reports. It appeared that the administration of an estate of this size necessitated nearly the entire time of a competent man, and that the collection of rents could be made economically by the collector of internal revenue. Accordingly, a recommendation to this effect was made and approved, resulting in Executive Order No. 15, series of 1906, and since April 1 the collections have been made by that bureau. Arrangements were made so that the rents became due on the second month of each quarter, during which time the collecting force of the collector of internal revenue have sufficient time to attend to this work, thus relieving a high-priced man for administrative work, who is much needed in the renting of the San Lazaro property.

An accurate survey of the estate has not been completed. A surveyor was detailed for this work, and a block map is being prepared showing the details of the subdivision of the estate, with a result that surveys are now completed of 41 blocks out of a total of 59. The additional blocks will be surveyed and completed as soon as possible and the lots advertised for rent.

No extensive improvements have been made in the street system of the estate during the past year, but I have undertaken to obtain concessions from the city authorities with the view to placing drains under the main roads to carry off surface water, and to begin the dumping of street sweepings in the many streets which are impassable during the rainy season, and it is believed that the city authorities will cooperate in this work, and some improvement at least may be made during the coming year in the street system.

A claim for taxes said to be due the city of Manila from the estate from 1901, amounting to ₱166,040.35, was referred to the attorney-general, who held that the estate was not subject to taxation by the municipality. Subsequently the

municipal board requested permission to bring suit for these taxes, but such permission was denied by resolution of the Commission on January 11, 1906.

The suits against Messrs. Martinez, Cenjor, and Velasco, referred to in the three preceding reports of this bureau, have at last been brought to a close, the supreme court holding in each of the three cases that the lease which was the basis of the litigation was not void, but good only for six years. As six years had elapsed since the making of the original leases, a new lease was made with N. T. Hashim, subtenant of Martinez, for a term of six years, upon a reduced area, at a yearly rental of ₱2,600, instead of ₱fs.400, as provided for in the original lease. Arrangements are now being made to issue a new lease to Velasco for a term of six years for the same approximate area at a yearly rental of ₱1,460, instead of ₱fs.151, which he formerly paid. The third case, that of Cenjor, will terminate in ejectment proceedings, as he has failed to pay the delinquent rent and sign a new lease, though twice requested in writing to do so.

The Rizal case, also noted in the last two reports of this bureau, was decided in favor of the plaintiff, Rizal, on October 7, 1905, and a notice of the decision served on the attorney-general. Through negligence this notice was placed in the files without action, although an appeal should have been taken. This error was not discovered until January of the present year, when an attempt was made to rectify the error, but without avail, as the statutory period during which appeals must be taken had expired. Through this error the estate will lose a considerable area of valuable land, worth ₱10 per square meter, or ₱10,652.40, costs and damages, and to a party whose claim of title should have been vigorously contested.

The status of the property in the Walled City has not been determined.

The expropriation of certain lands of the estate by the city of Manila for school purposes is also still pending.

A preliminary hearing of the case of the Archbishop of Manila *v.* Administrator of the San Lazaro estate was had before Judge John C. Sweeney in January of the present year, but the case being unfinished before the retirement of that judge from the bench the case will have to be reheard.

During the year it was again found necessary to resort to ejectment proceedings to enforce the payment of rents due from a number of the tenants. In all, 119 suits were brought, of which 67 were compromised upon the payment of the rents due and the costs of the suits. Fifty-two of the tenants sued were ejected for failure to so compromise, resulting in a loss of ₱1,609.11 in rents and ₱442.74 in costs.

This question is one which has caused considerable trouble to this bureau. The average yearly rental on a large portion of the estate is less than the costs necessary to secure ejectment. If the tenant becomes in arrears for one or two quarters, amounting to a peso or so, it would seem absurd to bring suit for the recovery of this small amount when the costs would amount to two or three times as much as the rent due. On the other hand, if the suits were suspended until a fairly large amount of rent is due, the corresponding loss to the estate is greater, in case no payment is made. In either case the tenants against whom these suits are brought find it cheaper to abandon the land than to pay the rents due plus the costs of the suit. One of these small nipa houses may be removed at a trifling cost, and a tenant who owes ₱2 for rent, plus ₱8 or ₱10 costs, will frequently vacate the land without paying either, rather than pay what he considers an unjust charge. Yet, if these suits are not brought, the collections gradually decrease from month to month and the delinquent list increases accordingly.

The most practicable solution of the matter appears to be the leasing of the lands in larger lots to a more responsible class of tenants, who will make improvements and invest capital to such an extent that prompt payments will be insured, or in default of such payments the improvements made will protect the estate from loss in case of suits for recovery of rents due. This can not be done, however, on a basis of a six years' lease, for, as has been stated in previous reports, no one with capital to invest cares to risk it on so short a term with no guaranty of continued possession of the lands after the termination of the six years; or, if there is a reasonable certainty of continued possession, there is still uncertainty as to the rate that will be charged after this period has expired.

An attempt is being made to arrange articles of agreement between the parties to the suit, the Archbishop *v.* Administrator, whereby the Philippine Commission will be requested to authorize the administrator to make leases for a greater period than six years, conditioned upon the improvement of the property

by the tenant to some specified amount, and it is anticipated that all parties to the suit will agree.

During the present year many of the vacant lots in the nipa district have been rented and not a few houses have been built; but in the district of strong materials the conditions are much the same as stated in the last report—the lands standing idle because capitalists hesitate to invest considerable amounts on short leases. During the present year there have been built, in the strong material district 16 houses, valued at ₱31,600. The greater part of this district, however, is vacant or occupied by nipa houses, which should give place to houses of strong materials. These nipa houses could easily be removed if there were a demand for the land which they occupy; but, for the reasons already given, there is no demand for the land for such purposes, and the nipa houses are permitted to remain for the sake of the rent received, which, though inadequate, is better than nothing.

The question of the amount of rent to be paid by the city of Manila for the use of the site of the city stables has been adjusted. The city was offered the use of 24,840 square meters for the yearly rental of ₱2,430.48, but up to the present date have not taken over the entire tract, but are paying at the rate of ₱2.138 for 21,587.10 square meters, the area actually occupied.

During the fiscal year ended June 30, 1906, the total amount of rents received from the estate was ₱50,243.75 as against ₱43,488.39 for the preceding fiscal year, an increase of nearly 16 per cent. However, I am of the opinion that under proper conditions the income from rents on this estate should approximate ₱100,000 per year, and it is proposed to place a clerk in charge of this work who shall have sufficient time to solicit leases and properly handle the estate. A basis of annual rental has been fixed at 5 per cent of the value of the property leased and it is anticipated that increased rentals will result during the ensuing year.

The delinquent rent roll on June 30, 1906, amounted to ₱12,511.65, of which ₱3,979 was pending settlement in court, and of the balance probably more than 50 per cent will be paid during the first quarter of the ensuing fiscal year.

Segregations of the expenses have been made with great care to the proper divisions of the work wherever it has been found impossible to make direct charges. Thus, in the statements of expenses of friar lands, public lands, or San Lazaro estate there is included a proportion of the expenses shown in the general statement under the subheads of general office and surveying and drafting, except in the case of furniture and fixtures, which remains under the subhead of general office. These divisions, general office, and surveying and drafting, are merely for economical administration, and each does work for the three natural divisions of the work of the bureau, viz: Friar lands, public lands, and San Lazaro estate.^a

Respectfully submitted.

C. H. SLEEPER, *Director of Lands.*

THE SECRETARY OF THE INTERIOR.

Manila, P. I.

EXHIBIT 1.

PROPOSED AMENDMENTS OF THE MINING LAW.

Letter of the Secretary of the Interior.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS,

DEPARTMENT OF THE INTERIOR,

Manila, September 20, 1906.

Respectfully returned to the Hon. Henry C. Ide, governor-general. The accompanying proposed amendments to the act of Congress of July 1, 1902, carrying out certain changes in the mining laws of these islands recommended in the last annual report of the secretary of the interior and in the report of the Commission, have been carefully examined by Mr. Goodman, of the division of mines of the bureau of science, by Mr. Lenear, of the attorney-general's office, and by the director of lands.

^a A statement of receipts and expenditures on account of the San Lazaro estate, bureau of lands, and a graphical chart showing the progress of friar lands administration to June 30, 1906, are on file in the War Department.

It appears that the provisions of the proposed amendments to sections 33, 36, and 75 satisfactorily carry out the recommendations of the Commission. Mr. Lenear has discovered that in several instances the preamble of a section did not altogether fit the text, and has introduced the needed changes to correct these small slips.

One or two questions are raised by the proposed changes which seem to me to be of importance, viz, the provision contained in the proposed amendment to section 53, which increases the area of coal claims from 64 hectares to 128 hectares for an individual and from 128 hectares to 768 hectares for a corporation, which allows a corporation three times the amount of coal land it might secure in the United States. The other is the provision that a person or association may not hold more than one entry at the same time. Unless there has been some change in the coal-mining laws of the United States, of which we have no knowledge here, both of these provisions seem to me inadvisable for the reason that on account of their great liberality they might subject the measure to attack, on the ground that we were recommending legislation which would facilitate the exploitation of coal lands by a few persons or corporations. It is very necessary that the time within which one may perfect a coal claim and purchase the land should be extended. As explained in detail in my last annual report, the great difficulty involved in getting experts out here, in securing the services of diamond-drill men, etc., necessarily results in the lapse of a considerable amount of time, if the owner desires to make legitimate and thorough investigation as to the actual value of the claim before paying for it. It seems to me that if we secure the same provisions as regards the extent of coal lands which may be held by an individual or corporation and as regards the number of claims that may be held which prevail in the United States we shall have accomplished all that is necessary or desirable. It may be, however, that there is some special reason for the insertion of these provisions which we can not fathom here, and doubtless it would be well on arrival at Washington to inquire what induced the person who drafted these amendments to make these unsolicited changes.

I am transmitting herewith substitute sections, in which the changes I suggest are incorporated. The reasons for all of them will be apparent from the letter of the director of lands, herewith enclosed.

DEAN C. WORCESTER,
Secretary of the Interior.

Draft of proposed amendments.

SECTION —. That section thirty-three of the act of Congress approved July first, nineteen hundred and two, entitled "An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands, and for other purposes," is hereby repealed, and the following substituted therefor, so that section thirty-three shall read as follows:

"SEC. 33. That, subject only to such limitations and regulations as may be provided for by the Philippine Commission or their successors to exempt navigation from artificial obstructions or to protect prior vested rights, all navigable waters and all shoal waters between low and mean high tide on shores, bays, and inlets of the Philippine Islands shall be subject to exploration and mining for gold and other precious metals by citizens of the United States, or persons who have legally declared their intention to become such, or of the Philippine Islands: *Provided*, That such exploration and mining shall be by virtue of licenses granted by the governor-general of said islands: *And provided further*, That no exclusive licenses for this purpose shall be granted except as to limited and prescribed areas under general regulations established by the Philippine Commission."

(See page 73 Compilation, etc., Alaska. S. Doc. 142, 59th Cong. 1st sess.)

SECTION —. That section thirty-six of the act of Congress approved July first, nineteen hundred and two, entitled "An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands, and for other purposes," and that part of section nine of the act of Congress approved February sixth, nineteen hundred and five, entitled "An act to amend an act approved July first, nineteen hundred and two, entitled 'An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands, and for other purposes'" and to amend an act approved March eighth, nineteen hundred and two, entitled "An act temporarily to provide revenue for the Philippine Islands, and for other purposes," and to amend

an act approved March second, nineteen hundred and three, entitled "An act to establish a standard of value and to provide for a coinage system in the Philippine Islands," and to provide for the more efficient administration of civil government in the Philippine Islands, and for other purposes, which refers to section thirty-six of the act of Congress approved July first, nineteen hundred and two, as hereinbefore mentioned, are hereby amended by inserting in the first paragraph thereof after the word "governing" the words "the number of mining claims that any person, corporation, or association may locate on the same vein or lode," and by inserting in the second paragraph after the word "provided" the words "that where a group of two or more contiguous lode or placer mining claims are held by any individual, corporation, or association, the total value of the improvements or labor required upon such group may be made or performed upon any one of the group; provided that any two claims in such a group have one boundary line in common; and by striking out the word "location" at the end of the first sentence of said paragraph and inserting in lieu thereof the word "relocation," so that the said section when amended shall read as follows:

"Sec. 36. That the United States Philippine Commission or its successors may make regulations, not in conflict with the provisions of this act, governing the number of mining claims which any person, corporation, or association may locate on the same vein or lode, the location, manner of recording, and amount of work necessary to hold possession of a mining claim, subject to the following requirements:

"On each claim located after the passage of this act, and until a patent has been issued therefor, not less than two hundred pesos' worth of labor shall be performed or improvements made during each year: *Provided*, That where a group of two or more contiguous lode or placer mining claims are held by any individual, corporation, or association, the total value of the improvements or labor required upon such group may be made or performed upon any one of the group; provided, that any two claims in such a group have one boundary line in common, and that upon a failure to comply with these conditions the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location of the same had ever been made, provided, that the original locators, their heirs, assigns, or legal representatives have not resumed work upon the claim after failure and before such relocation. Upon the failure of any one of several coowners to contribute his proportion of the expenditures required thereby, the coowners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent coowners personal notice in writing, or notice by publication in the newspaper published nearest the claim, and in two newspapers published at Manila, one in the English language and the other in the Spanish language, to be designated by the chief of the Philippine insular bureau of public lands, for at least once a week for ninety days, and if, at the expiration of ninety days after such notice in writing or by publication, such delinquent shall fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his coowners who have made the required expenditures. The period within which the work required to be done annually on all unpatented mineral claims shall commence on the first day of January succeeding the date of location of such claims."

SECTION —. That section seventy-five of the act of Congress approved July first, nineteen hundred and two, entitled "An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands and for other purposes," is hereby amended by amending the second clause of said section, so that the said section as amended shall read as follows:

"Sec. 75. That no corporation shall be authorized to conduct the business of buying and selling real estate, or be permitted to hold or own real estate except such as may be reasonably necessary to enable it to carry out the purposes for which it is created, and every corporation authorized to engage in agriculture shall, by its charter, be restricted to the ownership and control of not to exceed one thousand and twenty-four hectares of land. And it shall be unlawful for any member of a corporation engaged in agriculture, and for any corporation organized for any purpose except irrigation, to be in anywise interested in any other corporation engaged in agriculture. Corporations, however, may loan funds upon real estate security and purchase real estate when necessary for the collection of loans, but they shall dispose of real estate so obtained within five years after receiving the title. Corporations not organized in the

Philippine Islands, and doing business therein, shall be bound by the provisions of this section so far as they are applicable."

SECTION —. That section fifty-six of the act of Congress approved July first, nineteen hundred and two, entitled "An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands and for other purposes," is hereby amended by inserting after the word "authorized" in the first clause of said section, the words "the holding of," and by striking out the second and third clauses of the said section and inserting in lieu thereof after the words "or association of persons" in the first clause, the following words: "or by any association of persons, any member of which shall have taken the benefit of such clauses either as an individual or as a member of any other association," and by striking out all of the fourth and fifth clauses of the said section and inserting in lieu thereof the following: "and that persons claiming under section fifty-four shall be required to prove their respective rights and pay for the land filed upon within three years from the time prescribed for filing their respective claims, and upon failure to file proper notice or to pay for the land within the required period, the same shall be subject to entry by any other qualified applicant; and any person or association shall, after entering upon any quantity of vacant coal land as prescribed in the three preceding sections, and before obtaining a patent for same, have the right to mine and sell coal therefrom, provided that upon the coal extracted before obtaining a patent a royalty of thirty centavos per ton shall be paid to the government of the Philippine Islands in such manner as may be directed by the governor-general thereof. And provided that if a patent for the said land is not secured within one year after the time prescribed for filing claims for said lands, a tax thereon of ₱5 per hectare shall be paid into the Philippine treasury each succeeding year until the patent be secured," so that the said section when amended shall read as follows:

"SEC. 56. That the three preceding sections shall be held to authorize the holding of only one entry by the same person or association of persons, or any association of persons any member of which shall have taken the benefit of such sections either as an individual or as a member of any other association; and that persons claiming under section fifty-four shall be required to prove their respective rights and pay for the land filed upon within three years from the time prescribed for filing their respective claims, and upon failure to file the proper notice, or to pay for the land within the required period, the same shall be subject to entry by any other qualified applicant; and any person or association shall, after entering upon any quantity of vacant coal land as prescribed in the three preceding sections and before obtaining a patent for same, have the right to mine and sell coal therefrom, provided that upon the coal extracted before obtaining a patent a royalty of thirty centavos per ton shall be paid to the government of the Philippine Islands in such manner as may be directed by the governor-general thereof; and provided, that if a patent for said lands is not secured within one year after the time prescribed for filing claims to said land, a tax thereon of ₱5 per hectare shall be paid into the Philippine treasury each succeeding year until a patent be secured, provided that in lieu thereof, that on each claim located after the passage of this act, labor may be performed or improvements made equal in value to said tax, evidenced in such manner as may be prescribed by the Philippine Commission, and in the event of failure to comply with these conditions, that part of section 36 of this act which is applicable upon the failure to comply with the conditions for holding a mining claim shall apply thereto, except that the period within which the work shall be required to be done annually on all unpatented coal claims shall commence one year from the date of location of such claim."

Letter of the director of lands.

DEPARTMENT OF THE INTERIOR,
BUREAU OF LANDS,
Manila, September 19, 1906.

SIR: I have the honor to submit the following remarks regarding the proposed amendments to the mining law of the Philippine Islands, as submitted by the bureau of insular affairs:

The amendment to section 33 by the repeal of the present section and the substitution of a section providing for the exploration and mining of precious

metals on navigable waters and the fore shores appears to embody the recommendations contained in your last annual report.

The amendment to section 36, providing for the grouping of two or more contiguous lode or placer mining claims for the purpose of assessment work, appears to accomplish this purpose, but attention is invited to the proviso that "any two claims in such a group have one boundary line in common." So far as the experience of this office goes in practice this condition would seldom occur in either lode or placer claims on unsurveyed ground, but the provision of the mining law which provides for the filing of an amended declaration of location under certain conditions would give locators an opportunity to obtain the benefits of this proposed section.

The proposed amendment to section 53 materially increases the areas for coal claims, viz, from 64 hectares to 128 hectares for an individual and from 128 hectares to 768 hectares for a corporation. It appears to me that this area is excessive, as the maximum in the United States for a corporation is 128 hectares, with an additional provision for 128 more upon the expenditure of \$5,000, or a total of 256 hectares in the United States, and three times as much in the Philippine Islands. Inasmuch as this amendment was not recommended, as far as I can learn, and it might tend to delay the securing of the necessary amendments recommended, and as there have been no complaints regarding the area of coal claims made to this bureau, I am of the opinion that the area should be left as in the original act.

However, if this amendment is left as at present, and inasmuch as act No. 1128 provides, in section 7, "that payment for coal lands shall be made to the director of lands," while this amendment provides that it shall be paid to the collector of internal revenues or the provincial treasurer, it is recommended that the amendment be altered to read, instead of "proper provincial treasurer," "director of lands," and instead of "provincial treasurer or collector of internal revenues," "director of lands."

Section 56 appears to need correction in order to make the preamble correspond with the amended reading of the section. In the amended reading it is stated "that the persons claiming under section 53 shall," etc., while nothing in the preamble changes the original reading of this section, which is, "all persons claiming under section 54 shall," etc. It appears advisable to make the amendment read, "that persons claiming under section 54," which follows the reading of the Revised Statutes of the United States.

The amendment of section 56 further states a royalty of "15 cents per ton." I believe this amount should be changed to "30 centavos per ton" in order to conform with the act of Congress approved February 6, 1905, both in the preamble and in the amended reading of the section.

The preamble to the amendment states that "a land tax equal to that paid for a corresponding area of agricultural land shall be paid." The amended reading of the section is that "a tax thereon of five (₱5.00) pesos shall be paid." The latter reading appears to be clearer, and the preamble should be changed accordingly.

The greatest change, however, which appears in the proposed amendment is the change in the wording of section 56 by the insertion after the word "authorized" the words "the holding of" and by the insertion after the words "only one entry" the words "at any one time."

This amendment appears to throw open the right of individuals or corporations to enter more than one coal claim, which is denied in the United States. It is believed that under this amendment it is more easily possible for corporations to secure control of coal lands than under the present law, and while it would give prospectors better opportunities to obtain a valuable coal claim, as they will not have exhausted their right after filing and taking up one claim which might prove of little value and could abandon same and locate a new claim, but it is believed that it would also give a large corporation greater opportunities to monopolize the coal fields that exist in the Philippine Islands.

Section 75 as amended appears to embody the recommendations contained in your last annual report.

Submitted herewith copy of amendments changed as recommended herein, with the exception of the areas of coal claims, which are left as in the proposed amendments, and the suggested change in 56, which is left as proposed by the amendments, the words "at any one time" remaining.

Respectfully submitted.

C. H. SLEEPER, *Director of Lands.*

To the SECRETARY OF THE INTERIOR,
Manila, P. I.

EXHIBIT 2.

SALES CIRCULAR.

[Containing Chapter II of the public-land act, providing for sales of portions of the public domain, and instructions and forms pertaining thereto, issued November 23, 1905.]

Letter of transmittal.

DEPARTMENT OF THE INTERIOR,
BUREAU OF PUBLIC LANDS,
Manila, October 18, 1905.

SIR: I have the honor to submit herewith, for your consideration and approval, if found satisfactory, instructions governing the sale of public lands as provided in Chapter II, act No. 926, Philippine Commission, issued in compliance with the requirements of section 69 of said act. A copy of said Chapter II, with a copy of section 75, act of Congress approved July 1, 1902 (32 U. S. Stat., 691), and a copy of act No. 1404, providing that provincial treasurers shall act as local land officers, and copies of the forms to be used in connection with the purchase of lands under this chapter are attached hereto.

Very respectfully,

J. W. ANDERSON,
Acting Chief Bureau of Public Lands.

The honorable SECRETARY OF THE INTERIOR,
Manila.

Approved November 23, 1905.

DEAN C. WORCESTER,
Secretary of the Interior.

Instructions relative to the sale of public lands.

The following instructions, under Chapter II of the public land act (No. 926), providing for the sale of public lands, are promulgated, under section 69 of said act, for the information of those concerned. As a supplement hereto will be found a copy of Chapter II of said act, with section 75 of the act of Congress approved July 1, 1902 (32 U. S. Stat., 691), and a copy of act No. 1404, providing that provincial treasurers shall act as local land officers, and copies of the forms to be used in the purchase of lands under said chapter:

(1) *Lands which may be purchased and by whom.*—Unoccupied, unappropriated, and unreserved nonmineral agricultural public land may be purchased by individuals, by copartnerships, and by corporations and like associations. An individual, in order to be qualified to purchase, must be a citizen of the Philippine Islands or of the United States or of some of the insular possessions of the United States. A copartnership, in order to be qualified to purchase, must be composed exclusively of individuals having citizenship. A corporation or like association must be organized under and according to the laws of the Philippine Islands or of the United States or some State, Territory, or insular possession of the United States.

(2) *Area which may be purchased.*—An individual may purchase not more than sixteen hectares of land. A copartnership may not purchase a greater quantity of land than sixteen hectares for each partner. A corporation or like association may purchase not more than one thousand and twenty-four hectares.

(3) *Relative to corporations.*—Every corporation authorized to engage in agriculture must be restricted by its charter to the ownership and control of not more than one thousand and twenty-four hectares of land. (Sec. 75, act of July 1, 1902, 32 U. S. Stat., 691.)

A corporation organized in any State of the United States or its Territories or insular possessions—that is, any corporation organized outside of the Philippine Islands—is a foreign corporation here, and must comply with the Philippine laws governing the transaction of business in these islands by foreign corporations.

(4) *Citizenship*.—A citizen of the Philippine Islands is any inhabitant thereof who was a Spanish subject on April eleventh, eighteen hundred and ninety-nine, and then resided and has continued to reside in the islands, and who did not make a declaration of his desire to retain his Spanish citizenship before some court of record, as provided by the treaty of Paris, and the protocol of April twenty-eighth, nineteen hundred. The children and descendants of the citizens described, born since April eleventh, eighteen hundred and ninety-nine, are also citizens of the Philippine Islands.

Persons of foreign birth who have served in the Army, Navy, or Marine Corps of the United States (which is equivalent to a declaration of intention to become a citizen), or who have declared their intention to become citizens of the United States, can not enter upon, or procure title to, public land in these islands, and there is no court in the islands authorized to confer citizenship upon the persons described.

(5) *Location of public land*.—The Spanish Government made no regular survey of the public domain, and the present government has not yet authorized such a survey, so that neither the extent nor the location of the public lands is definitely known, and no map showing the location of the lands subject to sale can now be furnished. The only information as to the public or private ownership of a given tract may be obtained from the residents of the community in which the land is located, by consulting the records of the old "Registro de Propiedad" and the present register of deeds to see if the particular tracts about which information is sought have ever been registered. The land-tax assessment books of the provincial treasurer may show whether any taxes have been assessed against the land, and, if so, who claims it. The provincial treasurers will give prospective purchasers as much assistance as possible in locating the public lands.

(6) *Form of tract*.—All lands purchased by companies or corporations, whether previously surveyed or not, when the tract is of more than sixty-four hectares, must be taken, whenever it is possible, in contiguous squares of not less than sixty-four hectares each. But a purchaser of one or more tracts of sixty-four hectares may also take in connection therewith one rectangular tract of thirty-two hectares, provided the longer side of such smaller tract is contiguous to the square tract of sixty-four hectares, or to one of such sixty-four hectare tracts, if more than one is purchased.

Sales will not be made of land lying in such a manner as to give the purchaser control of any adjacent land, water, streams, shore line, way, roadstead, or other valuable rights to the prejudice of the interests of the public.

If application is made to purchase unsurveyed public land the tract must be in a single body, as nearly as practicable rectangular in form, and not more than eight hundred meters in length, when applied for by an individual.

(7) *A purchaser may also make homestead*.—An individual may purchase sixteen hectares of land and also enter a homestead, provided he complies with the law as to occupation, or residence, cultivation, improvement, and so forth, as to both tracts. The purchaser is required to occupy, cultivate, and improve the land. Such occupation may be by agent or by himself.

(8) *Application; procedure to purchase*.—Applications to purchase should be made on the blank forms printed and furnished by this bureau for that purpose. A duplicate application need not be filed. These forms may be obtained upon request from this bureau or from provincial treasurers who have been designated to act as local land officers.

If application be made by an individual it must be made under oath and give the citizenship of the applicant, his post-office address, the best possible description of the land applied for, that it is nonmineral in character, more valuable for agricultural than forestry purposes, and does not contain deposits of coal or salts. Great care should be taken to fill out all blank spaces in the application. If application be made by a corporation a certified copy of its charter or articles of incorporation must be filed. If made by an unincorporated association it must show that each member is qualified to enter public lands, under this chapter.

It is not necessary to have land surveyed in order to describe it in the application, nor is it necessary to employ a draftsman to make the sketch map called for by the application blank. The description and sketch are only advisory to the land officials, but must be as full and complete as possible. A stake should be firmly set in the ground at each corner of the tract which it is desired to purchase and the approximate distance between the stakes stated. The

names of the adjoining landowners should be given, and if the land is near a road or stream of water the name and distance to such road or stream of water should be stated. There is no objection, however, if an applicant desires, to have the land surveyed and the plat made by an expert, but the applicant must bear the expense thereof. At the end of the application the sketch map should show the points of the compass; the boundaries and names of adjoining landowners; the length of each portion of the boundary, as nearly as practicable, in meters; all roads, streams of water, and any other natural objects, with their names.

(9) *Sale ordered; appraisal; bids.*—After the application has been received and it has been determined from the report of the director of forestry that the land is more valuable for agricultural than forestry purposes, and the sale authorized by the secretary of the interior, the land will be appraised by this bureau and advertisement made for sealed bids therefor. The applicant and any other qualified person or company may submit bids for the land. An individual will not be allowed to bid upon sixteen hectares or less embraced in the application of a corporation or other association of persons covering more than sixteen hectares. All bids must be sealed and addressed to the director of lands. Each bidder must inclose with his sealed bid a certified check or post-office money order made payable to the director of lands, or order, for twenty-five per centum of the amount of the bid. If, upon opening the bids, it is found that the highest price is offered by more than one bidder, and one of such bidders is the original applicant, the land will be awarded to the original applicant. If, however, the original applicant is not one of such bidders, then the land will be at once put up for oral bidding and awarded to the highest qualified bidder upon his depositing twenty-five per centum of the amount of his bid and making proper application for the land, if he has not already done so.

All bids will be opened at the time and place designated in the advertisement and the land awarded to the highest qualified bidder; and all bidders other than the original applicant, at the time of submitting their bids, must also submit an application to purchase the land described in the advertisement. The application should be inclosed with the bid and must be on file in this bureau on the date of the opening of the bids. All bidders are entitled to be present at the opening of the bids, either in person or by agent, and, if by agent, such agent must have a power of attorney from the bidder he represents. The appraised value of the land, which must not be less than ten pesos per hectare, will be announced in the advertisement for bids, and any bid for less than the appraised value will not be considered.

(10) *Payment.*—The balance of purchase price of the land, after deducting the deposit made by the bidder, may be paid in full upon the making of the award, or in five equal annual installments, or in full at the expiration of five years from the date of the award. All sums of money remaining unpaid after the date of the award will bear interest at six per centum per annum from such date until paid. Deposits of all unsuccessful bidders will be returned at once.

(11) *As to adverse occupant.*—If application is made to purchase agricultural public land, and such land is actually occupied by another person who is qualified to make a homestead or other entry thereof, or by any native who is entitled by law to a free patent, such person shall be personally served with notice as to his rights and allowed a preference right for one hundred and twenty days from the date of service of such notice in which to make entry or apply for patent. If such person does not avail himself of his rights, he must voluntarily vacate the land or he will be legally ejected.

(12) *Patent.*—Patent will not issue to a purchaser until five years from the date of the award, and during that five years the purchaser must occupy, cultivate, and improve the land, and when proof of such occupancy, cultivation, and improvement has been made he must also make affidavit that he has not sold the land nor in any manner encumbered the title thereto.

(13) *Survey, payment for.*—A survey and plat must be made before patent issues. If the purchaser be a corporation, like association, or an unincorporated company, the cost of the survey must be borne by the purchaser, and if the survey be made in advance of the regular survey of the islands, if the purchaser be an individual, the cost will be borne by the insular government.

(14) *Revenue stamp.*—Paragraph six, section one hundred and sixteen, act numbered eleven hundred and eighty-nine, requires that a twenty-centavo

internal-revenue stamp be affixed to each certificate issued by an officer authorized to administer oaths. These stamps should be attached at the places indicated on the application.

(15) *Penalty for false oath.*—Section seventy-seven of the public-land act provides that any person who shall willfully and knowingly make false proof or a false affidavit in support of his application or claim respecting the lands of the Philippine Islands shall be deemed guilty of perjury and punished accordingly.

J. W. ANDERSON,
Acting Director of Lands.

Approved, November 23, 1905.

DEAN C. WORCESTER,
Secretary of the Interior.

Act No. 926, Philippine Commission.

CHAPTER II.

SALES OF PORTIONS OF THE PUBLIC DOMAIN.

SEC. 10. Any citizen of the Philippine Islands, or of the United States, or of any insular possession thereof, or any corporation or like association of persons organized under the laws of the Philippine Islands or of the United States or any State, Territory, or insular possession thereof, and authorized to transact business in the Philippine Islands, may purchase any tract of unoccupied, unappropriated, and unreserved nonmineral agricultural public land in the Philippine Islands, as defined in the act of Congress of July first, nineteen hundred and two, not to exceed sixteen hectares for an individual or one thousand and twenty-four hectares for a corporation or like association, by proceeding as hereinafter provided in this chapter: *Provided*, That no association of persons not organized as above and no mere partnership shall be entitled to purchase a greater quantity than will equal sixteen hectares for each member thereof.

SEC. 11. Purchases made under the provisions of this chapter of land previously surveyed must be made of contiguous legal subdivisions. All lands purchased hereunder, whether previously surveyed or not, in case the tract sought to be purchased exceeds sixty-four hectares in area, must be taken, wherever possible, in the form of contiguous squares which shall contain at least sixty-four hectares each: *Provided*, That in connection with the purchase of lands in one or more tracts of sixty-four hectares there may be purchased one rectangular tract of thirty-two hectares, the longer side of which must be contiguous to the square tract of sixty-four hectares, or to one of such tracts if more than one be purchased. In no case may lands purchased under the provisions of this chapter be taken in such a manner as to gain any such control of any adjacent land, water, stream, shore line, way, roadstead, or other valuable right as might be prejudicial to the interests of the public.

SEC. 12. An application to purchase land under this chapter must be filed with such officer as may be designated by law as local land officer, or in case there be no such officer then with the chief of the bureau of public lands. It must be executed under oath and must state the citizenship of the applicant and his post-office address; the location of the land desired, stating the province, municipality, and barrio in which the same is situated, and as accurate a description as can be given, showing the boundaries of the land, having reference to natural objects and permanent monuments, if any; a statement as to whether any part of the land is occupied or improved, and that it is nonmineral in character, more valuable for agricultural than for forestry purposes, and does not contain deposits of coal or salts. The application of a corporation must be accompanied by a certified copy of its charter or articles of incorporation. An unincorporated association must show that its members are severally possessed of the qualifications above required of individuals. In the case of a corporation or association organized outside of the Philippine Islands there must be attached to the application proper documentary evidence that the law governing the transaction of business in the Philippine Islands by foreign corporations or associations has been complied with.

SEC. 13. It shall be the duty of the chief of the bureau of public lands to examine all applications to purchase under this chapter, and to determine whether the applicant has the qualifications required in section ten hereof, and from the certificate of the chief of the bureau of forestry to determine whether the land applied for is more valuable for agricultural than forestry purposes. He shall report his findings to the secretary of the interior, who, after proper consideration and approval of same, shall order the sale to be made.

It shall also be the duty of the chief of the bureau of public lands to appraise the land applied for under this chapter, which appraisement shall not be less than ten pesos, Philippine currency, per hectare, and in making this appraisal he may call to his assistance any provincial or municipal official of the province in which the land lies. When the land shall have been appraised, as hereinabove provided, the chief of the bureau of public lands shall advertise the same for sale by publishing a notice thereof once a week for six consecutive weeks, in two newspapers, one published at Manila and the other (if any such there be) published near the land applied for, such notices to be published in both the English and Spanish languages. The chief of the bureau of public lands shall, with the approval of the secretary of the interior, prescribe in addition to the publication in newspapers, a suitable method of posting notice upon the land sought to be purchased or in the pueblo where the land is situated. The notices shall state a date not earlier than ten days after the date of the last publication of the notice in the newspaper published at Manila, upon which date the chief of the bureau of public lands will award the land to the highest bidder, or will call for new bids, or otherwise proceed as provided by law.

SEC. 14. All bids must be sealed and addressed to the chief of the bureau of public lands, and must have inclosed therewith a certified check or post-office money order, payable to his order, for twenty-five per centum of the amount of the bid, which amount shall be retained, in case the bid is accepted, as part payment of the purchase price: *Provided*, That no bids shall be considered which are for less than the appraised value of the land.

SEC. 15. Upon the opening of the bids the land shall be awarded to the highest bidder. If there are two or more bidders which are higher than other bidders and are equal, and one of such higher and equal bids is the bid of the applicant, his bid shall be accepted. If, however, the bid of the applicant is not one of such equal and higher bids, then the chief of the bureau of public lands shall at once submit the lands for public bidding, and to the person making the highest bid on such public auction the land shall be awarded; but no bid received at such public auction shall be finally accepted until the bidder shall have deposited twenty-five per centum of his bid, as required in section fourteen. The deposits of all unsuccessful bidders shall be returned at once by the chief of the bureau of public lands. The chief of the bureau of public lands, with the approval of the secretary of the interior, shall have authority to reject any and all bids hereunder.

SEC. 16. Lands sold under the provisions of this chapter must be paid for in the following manner: The balance of the purchase price, after deducting the amount paid by check or post-office money order at the time of submitting the bid, may be paid in full upon the making of the award, or may be paid in equal annual installments, or may be paid in one installment at the expiration of five years from the date of the award. All sums remaining unpaid after the date of the award shall bear six per centum interest per annum from such date until paid.

SEC. 17. No patent shall issue under the provisions of this chapter until the land has been surveyed under the direction of the chief of the bureau of public lands and accurate plat made thereof. The cost of such survey must be borne by the purchaser, if a corporation or like association, and if the survey be made in advance of the regular surveys of the islands; but where the purchaser is an individual the cost of the survey shall be borne by the insular government. Patents shall not issue until after the expiration of five years from the date of the award, and before the same shall issue the purchaser must show actual occupancy, cultivation, and improvement of the premises for a period of five years immediately succeeding the date of the award, and that he has not sold the land or in any manner encumbered the title.

SEC. 18. If at any time after the date of the award and before the issuance of patent it is proven to the satisfaction of the chief of the bureau of public lands, after due notice to the purchaser that the purchaser has voluntarily abandoned the land for more than one year at any time, or has otherwise

failed to comply with the requirements of the law, then the land shall revert to the Government and all prior payments of purchase money shall be forfeited.

SEC. 19. This chapter shall be held to authorize only one purchase of the maximum amount of land hereunder by the same person, or by the same corporation or association of persons; and no corporation or association, any member of which shall have taken the benefits of this chapter, either as an individual or as a member of any other corporation or association, shall purchase any other public lands under this chapter.

SEC. 20. In the event of the death of an individual applicant subsequent to the date of the filing of the application and prior to the issuance of patent, the distributees of his estate, as defined by law, may claim the privilege of being subrogated to the rights of the deceased applicant, and if they consummate the requirements of law for purchasing land hereunder, patent shall issue to such distributees.

SEC. 21. If any land applied for under the provisions of this chapter shall be actually occupied by any person who is qualified to make a homestead or other entry under the public-land laws of the Philippine Islands, or by any native who is entitled by law to a free patent, such person shall be personally served with notice as to his rights, and shall be allowed a preference right of one hundred and twenty days within which to make entry or apply for patent.

Proclaimed in force by civil governor July 26, 1904.

Section 75, act of July 1, 1902 (32 U. S. Stat., 691).

SEC. 75. That no corporation shall be authorized to conduct the business of buying and selling real estate or be permitted to hold or own real estate except such as may be reasonably necessary to enable it to carry out the purposes for which it was created, and every corporation authorized to engage in agriculture shall by its charter be restricted to the ownership and control of not to exceed one thousand and twenty-four hectares of land; and it shall be unlawful for any member of a corporation engaged in agriculture or mining and for any corporation organized for any purpose except irrigation to be in any wise interested in any other corporation engaged in agriculture or in mining. Corporations, however, may loan funds upon real-estate security and purchase real estate when necessary for the collection of loans, but they shall dispose of real estate so obtained within five years after receiving the title. Corporations not organized in the Philippine Islands, and doing business therein, shall be bound by the provisions of this section so far as they are applicable.

FORMS PERTAINING TO THE PUBLIC LANDS.

(Form No. 8.)

Sales application.

(By an individual.)

Bureau No. _____

Local Land Office No. _____

1. The undersigned hereby makes application to purchase the following described tract of land, under the provisions of Chapter II of the public-land act, No. 926, to wit: _____ situate in the barrio of _____, municipality of _____, island of _____, province of _____, Philippine Islands, and containing an area of _____ hectares, _____ ares, and _____ centares, said tract being as nearly as practicable rectangular in shape and not more than 800 meters in length, as indicated by the accompanying rough sketch.

2. To show that the qualifications required by law are possessed by the applicant, the following statement of facts is submitted:

3. My name is _____; my age is _____ years; the place of my birth was _____; I am a citizen of _____, and my post-office address is _____.

4. I have never heretofore purchased or otherwise acquired any land or interest therein under the provisions of the public-land act, except as follows: _____.

5. If the land herein applied for is awarded to me, it is my intention to occupy, cultivate, and improve it, and said land will not be sold or in any manner encumbered prior to the issuance of the patent therefor. The provisions of the public-land laws relating to purchases of public land are understood and will be fully complied with by me.

6. I have been upon and examined the land applied for, and it contains no indications of settlement or occupation, and to the best of my knowledge, information, and belief it is unoccupied, unreserved, unappropriated, nonmineral agricultural public land; contains no valuable deposits of coal or salts, and is more valuable for agricultural than forestry or other purposes.

(Signature of applicant.)

AFFIDAVIT.

Philippine Islands, province of ----- }
Municipality of ----- } ss.

7. I, -----, the person making this application, first being duly sworn, upon my oath depose and say: That I have read or have had read to me and thoroughly understand the foregoing application; that I signed said application and this affidavit in the presence of the officer who swore me; that each and every statement in said application is true and correct. So help me God.

8. Before me, at the place aforesaid, on this ----- day of -----, 190 , personally appeared -----, personally known to me to be the person whose name appears in the foregoing application, and in my presence he signed the said application and subscribed and swore to this affidavit.

9. The affiant exhibited to me his cedula, which was No. -----, issued at ----- on the ----- day of -----, 190 , which showed him at the date of said cedula to be ----- years of age, and a native of -----.

{ Here attach a 20-
centavo internal-
revenue stamp. }

(Officer authorized to administer oaths.)

(Official title.)

SPACE FOR SKETCH MAP.

(The services of a surveyor or expert draftsman are not required.)

(Form No. 9.)

Sales application.

(By an unincorporated company.)

Bureau No. -----

Local Land Office No. -----

1. The undersigned hereby makes application to purchase the following-described tract of land under the provisions of Chapter II of the public land act, No. 926, viz: ----- situate in the barrio of -----, municipality of -----, island of -----, province of -----, Philippine Islands, and containing an area of ----- hectares, ----- ares, and ----- centares; said tract conforming in shape to the requirements of section 11 of said public-land act, as indicated by the accompanying rough sketch.

2. To show that the qualifications required by law are possessed by the applicant, the following statement of facts is submitted:

3. The unincorporated association or organization, on whose behalf I make this application, is composed of the following-named persons, the place of birth, citizenship, and post-office address of each being set opposite his name, to wit:

Name.	Place of birth.	Citizenship.	Post-office address.
-----	-----	-----	-----
-----	-----	-----	-----

4. The main office or principal place of business of the company is at -----, and Mr. ----- is in charge thereof in the capacity of ----- . A copy of the articles of agreement of the copartnership, association, or organization is attached hereto and made a part of this application. The retirement from the organization of any of the above-named members, or the addition thereto of any new members not hereinabove named, will be promptly reported to the director of lands at Manila.

5. The company in whose behalf I make this application has never purchased nor acquired any interest in any land under the provisions of the public-land act, No. 926, except as follows: -----

6. No member of said company has ever purchased or acquired any interest in any land under said public-land act, except as follows: -----

7. If the land herein applied for is awarded to said company, it is the intention of the members thereof to occupy, cultivate, and improve the same as required by law; and the land will not be sold or in any manner encumbered prior to the issuance of patent therefor. The provisions of the public-land laws relating to purchases of public land are understood and will be fully complied with by the applicant.

8. The authority of the undersigned to make this application is hereto attached, and the undersigned has been upon and examined the land applied for, and it contains no indications of settlement or occupation, and, to the best of his knowledge, information, and belief, it is unoccupied, unreserved, unappropriated, nonmineral, agricultural public land; contains no valuable deposits of coal or salts, and is more valuable for agricultural than forestry or other purposes.

(Signature of person swearing to application.)

(Name of company which is the applicant.)

By -----

AFFIDAVIT.

Philippine Islands, Province of ----- } ss.
Municipality of ----- }

9. I, -----, the person making this application for said company, first having been duly sworn, upon my oath depose and say: That I am the duly authorized agent of said company; that I signed said application and this affidavit in the presence of the officer who swore me; that each and every statement in said application is true and correct. So help me God.

10. Before me, at the place aforesaid, on this the ----- day of -----, 190 , personally appeared -----, personally known to me to be the person whose name appears in the foregoing application and in my presence signed said application and subscribed and swore to this affidavit.

11. The affiant exhibited to me his cedula, which was No. -----, issued at -----, on the ----- day of -----, 190 , which showed him at the date of said cedula to be ----- years of age and a native of -----.

{ Here attach a 20-
centavo internal-
revenue stamp. }

(Officer authorized to administer oaths.)

(Official title.)

SPACE FOR SKETCH MAP.

(The services of a surveyor or expert draftsman are not required.)

(Form No. 10.)

Sales application.

(By a corporation.)

Bureau No. -----

Local Land Office No. -----

1. Application is hereby made to purchase the following-described tract of land under the provisions of Chapter II of the public land act, No. 926, viz: -----, situate in the barrio of -----, municipality of -----, island of -----, province of -----, Philippine Islands, and containing an area of ----- hectares ----- ares and ----- centares; said tract conforming in shape to the requirements of section 11 of said public-land act, as indicated by the accompanying rough sketch.

2. To show that the qualifications required by law are possessed by the applicant, the following statement of facts is submitted:

3. The corporation on whose behalf this application is made is known as -----, and was organized under the laws of -----, and its principal place of business or main office is at -----, and Mr. ----- is in charge thereof in the capacity of ----- A certified copy of the charter or articles of incorporation, and the required documentary evidence showing that the law governing the transaction of business in the Philippine Islands by foreign corporations has been complied with, are hereto attached and made a part hereof.

4. The corporation on whose behalf this application is made has never heretofore purchased any land or acquired any interest therein under the provisions of the public-land act, No. 926, except as follows: -----

5. No member of said corporation has ever purchased any land or acquired interest therein under said law, except as follows: -----

6. The land owned in the Philippine Islands by said corporation consists of the following tracts of the following areas, and the same is all the land owned by said corporation in the Philippine Islands, viz: -----

7. If the land herein applied for is awarded to said corporation, it is the intention of said corporation to occupy, cultivate, and improve the same as provided by law, and said land will not be sold or in any manner encumbered prior to the issuance of the patent therefor. The provisions of the public-land laws relating to purchases of public land by corporations, and the restrictions, limitations, and requirements of section 75 of the act of Congress of July 1, 1902, are understood and will be fully complied with by the applicant.

8. The undersigned has been upon and examined the land applied for, and it contains no indications of settlement or occupation, and, to the best of his knowledge, information, and belief, it is unoccupied, unreserved, unappropriated, nonmineral, agricultural public land, contains no valuable deposits of coal or salts, and is more valuable for agricultural than forestry or other purposes.

(Signature of person swearing to application.)

(Name of corporation making the application.)

By -----

AFFIDAVIT.

Philippine Islands, Province of ----- } ss.
Municipality of ----- }

9. I, -----, the person making this application for the corporation aforesaid, first having been duly sworn, upon my oath depose and say: That I have read and understand the foregoing application; that I signed said application and this affidavit in the presence of the officer who swore me; that I am duly authorized by said corporation to make this application on their behalf; that each and every statement in said application is true and correct. So help me God.

10. Before me, at the municipality aforesaid, on this ----- day of -----, 190 , personally appeared -----, personally known to me to be the person whose name is signed to the foregoing application, and in my presence he signed said application and subscribed and swore to the foregoing affidavit.

11. The affiant exhibited to me his cedula, which was No. _____, issued at _____ on the _____ day of _____, 190____, which showed him at the date of said cedula to be _____ years of age and a native of _____.

{Here attach a 20-
centavo internal-
revenue stamp. }

(Officer authorized to administer oaths.)

(Official title.)

12.

SPACE FOR SKETCH MAP.

(The services of a surveyor or expert draftsman are not required.)

Bid for public land.

The DIRECTOR OF LANDS.

Manila, P. I.

SIR: Referring to your advertisement in the _____ of _____ (date) _____, in which you call for bids for the public land described in sales application No. _____, I have the honor to submit my bid of _____ ₱_____, per hectare, amounting to ₱_____ for said land.

I inclose herewith a _____ (money order or certified check) _____ for _____ ₱_____, which is twenty-five per centum of the amount of my bid.

(Bidder.)

P. O. address: _____

(Bidders should carefully fill out this form and inclose it with the remittance in a sealed envelope. The envelope should be plainly marked "Bid for public land described in sales application No. _____," addressed to the Director of Lands, Manila, P. I. A formal application for the land should accompany this bid if one has not been submitted already.)

(No. 1404.)

An act providing that provincial treasurers shall perform the duties of local land officers.

By authority of the United States, be it enacted by the Philippine Commission, that:

SECTION 1. Provincial treasurers, under the direction of the chief of the bureau of public lands, and pursuant to section fifty-two of the act of Congress approved July first, nineteen hundred and two, entitled "An act temporarily to provide for the administration of the affairs of civil government in the Philippine Islands, and for other purposes," shall perform the duties of local land officers in their respective provinces. Each province shall constitute a land district.

SEC. 2. The chief of the bureau of public lands is hereby authorized to make such rules and regulations, subject to the approval of the secretary of the interior, as may be necessary and proper for the purpose of carrying the provisions of this act into full force and effect

* * * * *
Enacted, October 13, 1905.

APPENDIX F.

REPORT OF THE DIRECTOR OF AGRICULTURE.

MANILA, P. I., *August 10, 1906.*

SIR: I have the honor to make my annual report as director of agriculture for the ten months ended June 30, 1906. During this time I was absent on duty in the United States for eight months. The affairs of the bureau were handled by the assistant director.

The veterinary division of the board of health was transferred to the bureau of agriculture November 1, 1905, and made part of the division of animal industry. The Lamao Forest Reserve was transferred at the same time from the forestry bureau. These will be further discussed below.

The large San Ramon farm, devoted principally to cocoanuts, and Manila hemp, was transferred to the Moro Province November 1. The province is, I understand, making large investments in opening new lands and making new plantings intended for distribution of young plants to the people of Mindanao. The nearness of this farm to the provincial capital, the opportunity for using prisoners to open up land, and other natural advantages no doubt rendered it advisable that this farm should be transferred to the Moro government. The work heretofore done in rice culture at Murcia on leased land has been transferred to Cavite Province to some much better land on one of the friar estates. The small Batangas station has been transferred to the bureau of education and is now used for school garden work. These changes will be discussed further on.

The former combined expenses of the bureau and its added divisions have been materially reduced. Much of the saving has been made on the veterinary corps, since rinderpest has been less prevalent in the islands for the past eight months than for years before.

SEED AND PLANT INTRODUCTION.

During the year about 2,000 applicants were supplied with some 20,000 packets of garden seed and 2,500 pounds of field seeds. About 58 per cent of the applicants were Filipinos and 42 per cent of all other nationalities, including many American teachers who used the seed for the instruction and benefit of the native pupils. An order has been placed for 200,000 Hawaiian sisal plants, which are expected to arrive during July, August, and September. Two hundred applications have been received for allotments of these plants, mostly from the maguey-growing districts. All of them will be supplied as far as practicable. About 1,000 pounds of white-seeded sesamum have been distributed gratuitously, and various amounts of sugar cane, forest, shade, and ornamental trees sold or given away. One hundred bushels of Carolina golden seed rice have been imported, principally for distribution.

The seeds sent out the past year have all been tested before going out and most of them have proved good when planted. In a warm, wet climate like this, seeds deteriorate and lose germinating qualities quickly. With slow and difficult transportation and delays about planting after reaching the planter, it need not be surprising if some seeds, good just before mailing, may prove bad when planted. As may be expected only a small proportion of those receiving seeds report results. Of those reporting, the majority have had good success. The greatest proportion of successful results from American and other temperate-zone seeds were had from plantings made from October to

January, when the weather is cool and moderately dry. Most staple vegetable crops do well here at some season. Fine crops of cabbage may be grown from December to February. Of course, in order to have cabbage for any considerable portion of the year cold storage would be necessary. English peas and Irish potatoes do not thrive near sea level, but at 4,000 feet elevation they do excellently.

Considerable work is now being undertaken in cultivating native vegetable crops. These are generally of quite robust habit and many of them grow almost, if not entirely, wild. One of the striking things to me of the agriculture of the islands is that practically all of the crops successfully grown are those strong, vigorous vegetable giants, like cocoanuts, rice, cane, corn, sorghums, abacá (manila hemp), bananas, etc., that are capable of fighting their way among weeds and even forest jungle in some cases. A few of those are to be found in the shape of strong climbing legumes and cucurbits. One of the former has a pod something like 30 inches long, 2 inches wide, and a half inch thick. Sliced up and prepared as string beans it forms one of the most delightful vegetable dishes that may be had in any country. This vegetable is unknown in 90 per cent of the islands, I am told. Its great vigor will perhaps enable it to thrive at all seasons. There are other beans as vigorous as the velvet bean of Florida grown for live stock, and yet they make excellent human food. There is a large class of squash-like vegetables, looking rather more like gourds than squashes. These have great vigor. They are rather tasteless, but sweetened and flavored they serve the purpose of squashes, pumpkins, etc., of temperate countries. These and other native vegetables will doubtless be susceptible of great improvement.

COFFEE.

The plantation of Brazilian coffee, known as the Maragogype hybrid, made at Lipa three years ago, is fruiting heavily, and so far showing no signs of the hemeleia, the disease that destroyed the once prosperous coffee industry of Batangas. Arabian coffee in the same neighborhood is badly affected. This Brazilian hybrid is criticised as being lacking in productiveness, but at Lipa and at Manila three-year trees are showing quite a third of a pound per tree.

It is believed that gradually the coffee industry, all but lost, may be restored, at least up to the point of wiping out the imports of \$114,578 worth per annum. Java once lost an immense coffee industry from the same causes, and many years ago began building it up again by planting robust kinds of trees. That country has replaced one-third of her former great production.

SESAMUM.

A little sesamum seed has been grown here for a long time. It is a seed rich in oil and other nutrients, and has generally been cooked up with sweets and eaten by the people. Considerable has been exported, some ten to fifteen thousand dollars' worth. The building of a very large cocoanut-oil mill by a firm that is also in the market for other oil seeds makes sesamum appear to be a promising crop. It will grow well on land not suited to rice; it will grow at any season, and it appears will yield a crop about equal to rice in money value, yield it quicker and with a good deal less labor and expense.

The dark-seeded varieties grown here do not make a light-colored salad oil, and hence do not command the best price. Hence the distribution by the bureau of 1,000 pounds of white seed.

BROOM CORN.

Some \$10,000 to \$15,000 worth of corn brooms and brushes are being imported each year into the islands. American broom-corn seed was introduced the first time the past year. A crop grew splendidly in the dry season and produced nearly 600 pounds of good, straight, green-colored brush. That yield is about equal to the Illinois average, and the quality of the brush seems quite as good. I am told a company has already ordered an outfit for broom making, and will grow their own brush, if necessary, but prefer buying from others if it can be had. Brooms delivered here cost more than twice as much as in the United States, so there ought to be fine profits for one or two small enterprises in this line.

NEW FIBER PLANTS.

Indian hemp (*hibiscus cannabilis*), sunn hemp (*crotalaria juncea*), and ramie (*boehmeria nivea*) have all been introduced and have made good growth.

Tanias, West Indian plants somewhat on the order of the Hawaiian taro and the Philippine gabi, have been introduced and are multiplying rapidly. Many fruits, nuts, and trees have been introduced from Java, India, Queensland, and tropical America.

SORGHUMS.

Neither sweet sorghum nor the Kafir corn was known here until two years ago. Both have done remarkably well on all sorts of land and at all seasons. They grow with such ease and yield so abundantly that they are being largely grown in the islands, as forage principally. The Kafir corn produces a grain comparing fairly well with rice or corn in nutritive value. Considering the great drought-resisting qualities of this plant, there can be no question but that rice land devoted to Kafir corn in the dry season would make more food than it does in rice during the wet season. The people of Batangas, Cavite, Capiz, and other provinces eat the seed of an inferior sorghum partaking of the nature of broom corn or Dhoura corn. The Kafir corn is white, clean and full of starch.

SUGAR CANE.

Some experiments in cane culture were carried on at Manila. Five leading varieties of cane coming to us from Honolulu were tested for yield and saccharine content. This cane had been planted early in the dry season, was well fertilized, and well worked. By September it had attained very much more than the usual size; in fact, it had become so large that it suffered much more than cane of the usual size from the great typhoon of September 26, 1905. We found that it was so broken and twisted that the experiment was worthless. The average yield when harvested indicated 24 tons per acre. The laboratory results showed that none of it would have been profitable for milling. This arose from the damaged condition of the cane and sprouting and new growth that set up after the damage. A part of this experimental patch was prepared by trenching 18 inches deep and the balance by plowing about 5 inches deep. No difference could be observed in the growth of the crop. Another planting of cane was made in June, 1905—an unusual time for this country—to see if it could be carried through two wet and one dry season, aided by irrigation, and mill at end of last wet season, and thus lengthen the usual grinding season. This cane is now fourteen months old and has not flowered. I think it will not flower until the end of the wet season, bringing it up to sixteen or seventeen months of age. But another trouble has been encountered. It has grown tall, with thin stalks. With the advent of the rains the tops became quite heavy. It has already been severely injured by one typhoon, and it is quite likely that the next one will spoil it so it would not be worth milling. It is now my opinion that in most of the islands cane will have to be planted so as to ripen in twelve months, and even then fertilizing and irrigating so as to stimulate extraordinary growth may prove unprofitable on account of our severe storms.

Several imported varieties have shown greater vigor than the cane long grown. These differences were exaggerated, too, by the fact that the new canes were planted early, fertilized, and given a better chance. They showed a tendency to ripen later and to have less sugar in juice. These tendencies would be a natural result of the fertilizing, etc., so there is probably less difference in value of the varieties than most men have believed from looking at the canes. Other sugar-cane experiments are in progress, but no results can yet be announced.

LEGUMINOUS FORAGE CROPS.

The great value of the Florida velvet bean as a cover crop to choke out foul weeds and grasses, to enrich the land by supplying nitrogen from the air, and as a forage crop has been only emphasized. It is not only too strong for any other plant likely to dispute possession of the soil with it, but no disease affects it, and it never fails to make a crop, regardless of seasons. The Spanish peanut, only lately introduced, will certainly become a valuable addition to the crops of the country. Its large yield, quick maturity, and ease of harvesting can not but commend it when compared with the kinds usually grown here. A great many seed have been grown and distributed by the bureau.

OTHER CROPS.

Chufas, lately introduced, do remarkably well here. This is a little root crop grown in the Southern States for hogs, and in Southern Europe it is eaten by people. I have little doubt it will rapidly become popular here for human and animal food.

A plot of cassava about 1 year old was harvested in May of this year and yielded at the rate of 11.6 tons per acre. In a previous report I called attention to the probable profits that might be made growing this crop and manufacturing into starch and tapioca. So far, no one that I know of is engaging in its cultivation in a commercial way. It is also a splendid animal food, 11.6 tons of it being equal in feeding value to about 3 tons or 105 bushels of corn.

LAMA O FOREST RESERVE.

At Lamao, across the bay in Bataan Province, and extending up to the top of the mountain along the valley of the Lamao River, is situated this forest station. Near the coast the brush and jungle have been cleared from perhaps 60 acres, and many introduced species of forest trees, shrubs, shade trees, and fruit and ornamental plants are being grown.

The surplus shade and ornamental trees propagated at Lamao are offered for sale, and quite a large number have been distributed during the past year. There is not a large and steady demand as yet for these plants, so as to make their sale any particular object, more than to meet a part of their extra cost in growing and handling.

A nursery of about 20 acres of maguey plants has been started during the year, along with a few acres devoted to kapok (tree cotton, fit for stuffing only), sansevieria (a fiber plant), pineapples, bananas, rubber of different species, lemons, grapes, etc. An irrigation canal was run through this place during the year. This was a necessity for many of the trees and plants of the station.

With a system of exchange of plants and seeds with different parts of the tropical world, material additions are constantly being made to the reserve. To care for the extended areas properly will probably require additional expenditures.

The labor supply, which is none too good, costs 80 centavos a day per man.

FIBER INVESTIGATIONS.

For the past year much interest has been devoted to the subject of maguey cultivation. This cultivation has been increasing rapidly the past few years, especially on the west coast of Luzon. A little over a year ago I believed—and so excellent an authority as Mr. E. D. Merrill, botanist, bureau of science, believed—the maguey of the Philippines to be the true Yucatan sisal or agave figida. It was impossible to distinguish it from any descriptions published. Learning at that time that two of the leading authorities in the world had given differing opinions as to the identity of our plant, I felt reasonably sure it was the true Yucatan plant brought here by the Mexicans. Now, it appears, all the leading authorities who have had a chance to grow the plants and make comparative studies agree that the Philippine plant is agave cantala. It would seem probable that it reached here from India instead of Mexico. We observed also that we get only 2 to 2½ per cent of fiber as against 4 to 5 per cent from the Yucatan or Bahama leaves. Then the dealers in New York and London, while valuing the machine-cleaned maguey fiber about as high as Yucatan or Bahama sisal, remarked on the fineness of the fibers and doubted that it could be from the same plant. Mr. H. T. Edwards, fiber expert of this bureau, who visited Yucatan last September, has no doubt that the maguey is quite a different plant from the kind grown there.

Since in getting 200,000 plants from Hawaii, in addition to the 50,000 brought last year, we get a variety containing twice the fiber the maguey has, and also get a plant much easier to handle on account of being free from spines on the sides of the leaves, I must believe it is a work of great importance for the islands. I would urge that a million more plants be brought another year.

Mr. Edwards found, as a rule, that Yucatan plantations are large and that their owners have grown quite wealthy. The largest cleaning machines to be had are in general use, the leaves being brought in on small railroads. Small machines are almost out of use and out of the market.

Here the plants are generally taken to salt water and retted for a week or more. The poorly cleaned fiber is then dried and marketed at a considerable discount. In the present state of the industry there is considerable inquiry for small cleaning machines such as will suit the needs of each small grower. I doubt if lightness and cheapness on the one hand and efficiency and low cost of operation on the other are very compatible.

I have not yet visited the maguey sections, but have wondered if one or more large mills might not own and operate small railways through the fields and buy and work the leaves. Other little lines might come to the coast at different points, and then concentrate the leaves at mills by means of boats. There are, doubtless, streams in some cases that would carry in barges loads of material.

An old raspador, or Mexican sisal-cleaning machine, of the primitive kind was gotten last year. It cleaned maguey and abaca, but we could not do more than 75 to 100 pounds a day, and it seemed to require some two to four horsepower to do this. Of course, such a machine can not be recommended, as it would not pay over old methods. There are fairly small machines greatly superior to the raspador, and the bureau is negotiating for one of these.

ABACA, OR MANILA HEMP.

The investigations concerning abaca, the great export crop of the islands, have been continued. The cultivation of this plant is the one agricultural industry that has proved attractive to American investors. The crop, since the typhoon of September, 1905, has been short, but prices are high. Although this crop is generally grown without the use of any form of plow and is hardly ever weeded after the first two years, during which it is reaching maturity, the gross average value per acre appears to be twice that of the cotton crop of the United States and nearly four times the average of an acre of wheat. This crop has a limit set on its production by the number of men who can be gotten to clean the fiber. Half the output is given to the men that clean the fiber and get it ready for market. So slow is the process that a man perhaps averages cleaning 20 pounds a day, and only a few men will do it at all. Hence the bureau has taken great interest in encouraging inventors and builders of machines. We have sent hemp stalks to England and America for trials of machines. Quite a large number of people are working on machines of various designs, and one or two builders have small machines working in the hemp districts, but with what success I do not know. A large machine, weighing over two tons and costing about \$1,200 United States currency, has lately arrived.

Most people in touch with the abaca industry contend that a machine to be successful must be small and light enough to be carried by men up mountain trails, and be operated by man power. Hence most inventors have thus far tried to produce machines fulfilling these requirements. I have myself never held this view of the situation. I believe that a machine to fulfill these requirements will be no better than the old device that has been used a century or two. The native hemp cleaner, by having a knife with its blade pressing down against a block of hard wood, with suitable tripping device, manages to clean 20 pounds of fiber a day by drawing the strips of material under a knife by exhausting all the muscular energy he has. How an inventor expects to follow essentially the same principle and by interposing a few pulleys, belts, levers, and cranks between the man and the knife and block and have the same man clean 50 to 100 pounds a day is not clear to me. All machinery loses some power instead of gaining it.

I believe a hand-power hemp-cleaning machine just as impossible as a hand sugar-cane mill or a hand sawmill. Sugar cane, timber in the log, and sisal leaves all have about the same value per ton as Manila hemp stalks. All of the former universally go to large central mills, and some of them for hundreds of miles. Abacá stalks are much easier to handle than any of the others. Each stalk is a convenient load, weighing about 50 pounds. They float as nicely as cork, almost. Fluming them out of the hills and mountains into the larger streams and then rafting or barging to large mills would be a transportation problem easier and cheaper far than sugar cane or sisal leaves ever enjoyed. This is what we must look to, in my judgment, instead of a very light machine. I think we would have had successful machines already if most workers had not been on the wrong track.

Our work has continued along the line of determining the actual fiber in the abacá stalks and the amount usually gotten by different methods of cleaning. Several trials have confirmed previous results, showing that it is more profitable

to clean with a serrated knife and turn out a poor grade of fiber than to use a smooth knife and turn out a fine grade of fiber. The market does not discriminate enough to make it profitable to do close cleaning and turn out the best material. We have confirmatory information of last year's results, showing that of all the good fiber produced the old method of cleaning loses some two-thirds of the whole and saves about one-third. With close cleaning, so as to turn out fine fiber, the loss is certainly this great. Producing the poorer grades of fiber, it will not be so great. With the method of machine cleaning, involving a heating and shredding process along with scraping, as first practiced by the bureau last year, so as to work the whole plant instead of thin ribbons from each petiole, double the quantity of fiber is saved that can be by knife cleaning, the two processes turning out fiber of the same market value.

With average losses of certainly 60 per cent of the fiber produced, and valuable as this waste is for paper making, I doubt if it will be collected and marketed under present conditions. Only a few hundred plants are cleaned at any one place before the knife is moved to another place. The waste is difficult to dry and is probably too expensive to handle and transport in a small way for any price manufacturers would likely offer.

Paper makers are very anxious to get good supplies of this material. While in Washington a manila-paper manufacturer from Boston visited me twice to discuss the matter and induced me to cable for 2 tons of abacá waste and 2 tons of cogon grass for mill trials. He explained that the old rope available is no longer sufficient to supply the world's wants of manila paper and that a new supply of raw material would have to be found if possible.

Complete chemical results are now being gotten of the actual fiber in the stalks, in the different parts of the stalk, in the part cleaned and in the part rejected by the cleaner, in the waste he makes of the part he does clean, in the actual fiber or cellulose, in the different grades of fiber, etc.

ABACÁ DEVELOPMENT IN MINDANAO.

Largely traceable to reports and bulletins of the bureau is the great development of hemp growing in Davao Province, Mindanao. Thirty-five American plantations on a large scale have been started and many more projected. Three million five hundred thousand plants, covering 10,000 acres, are now growing. Development is restricted for want of young plants, whose price has soared beyond reasonable limits. This bureau now has a large number of abacá seed planted with a view to starting nurseries of seedling plants to supply these wants and to show others how to start them. It is said to require a year longer to bring seedlings to the harvesting stage than it does the suckers now universally planted.

Certain observations point to artificial irrigation for Manila hemp as being a wonderful aid in stimulating early maturity and large yields of fine long fiber. I have no doubt that combined irrigation ditches and flume lines will soon water the crops on the best plantations and at the same time float the mature stalks to large cleaning mills, where all fiber will be graded and baled and waste saved, dried, and baled for market, perhaps first being boiled with soda or lime to get rid of nonfibrous material and reduce shipping weight.

Something over a half century ago it cost some \$45 United States currency a bale to gin cotton on the Alabama River and deliver it to a factory in Manchester. Now cotton is ginned on the same plantation and put down in the same factory at a cost of, all told, about \$5 a bale. Our abacá industry even suffers costs for cleaning and handling such as cotton suffered before the use of the cotton gin, when the lint had to be picked from the seed by hand.

KAPOK, OR TREE COTTON.

Some commercial shipments of kapok, or stuffing cotton, have gone to the United States since we discussed its value last year. A machine was received from England for cleaning it of seed, but the machine was a failure. A slow-working English cotton gin does work it, but not rapidly enough to meet the conditions of large development. The American saw gin failed to work it. Lately a commercial firm has received an American machine designed and built especially to clean it, but this machine has not yet been set up. To clean this material would seem to present no great difficulties, and a machine would not need to be very strong, heavy, or expensive.

The kapok, from numerous inquiries I made in the United States, appears to have a steady value of 9 to 13 cents United States currency a pound. It sells in some of the provinces as low as ₱3 a picul (137½ pounds) in the seed. It turns out about 35 per cent lint and 65 per cent seed. The seed have an oil content and the cake a fertilizing and feeding value that ought to give the seed a value of ₱50 to ₱60 a ton. Even at a higher purchase price for the raw cotton, fine profits should be made by buying and cleaning this material with suitable machines.

The real cotton has generally not been successful with us. A species of boll weevil generally prevents any yield of account. There may be localities where this insect is not found, but at present we do not feel like encouraging cotton growing in more than an experimental way.

A new and unidentified species of agave, said to be quite superior to Yucatan sisal, has been introduced from Tuxpan, Mexico.

TRINIDAD STATION.

Owing to a change of managers a few months ago, I have not a very full report from this farm. Situated nearly 5,000 feet high, where occasional light frosts are experienced, most Temperate Zone vegetables have generally flourished. This year potatoes blighted for the first time there. This can probably be counteracted by spraying. Onions, which I had hoped could be grown in large quantities, did not succeed, but I believe they can yet be grown. I have seen a few as fine onions grown in that valley as I ever saw anywhere. Tomatoes grown there were remarkably fine the past season. Cucumbers, squash, carrots, peas, beans, and peppers all did well. Cabbage did well, as it usually has done there, but insects injured it badly. This difficulty can be met.

Oats, wheat, and barley grow very well there, but incline to make leaf and stalk at the expense of grain. It may be that varieties will be found that will develop normally. Grain rust was prevalent the past season, so that an effort will be made to get resistant varieties. These grain crops have thus far been cut and fed green at the stock farm.

Corn, sorghum, teosinte, and other forage plants have been grown. The weather is almost too cool for any of these to do well, but the sorghums do better than the others. The clovers grow beautifully, but so far have matured no seed. Alfalfa also grows quite well, but likewise matures no seed.

With the stock farm now situated near by and with a good road through to Baguio better supplies of manure can be had and better results predicted. Commercial fertilizers are sent up from time to time, but owing to transportation difficulties these are as yet quite costly to deliver there.

The plant breeder of this bureau was sent to this farm the latter part of February for the purpose of studying the small grains then in flower, collecting native plants promising to be of economic value, and conducting experiments in plant breeding. Most of his time was spent in studying the conditions that prevail, collecting and propagating seed and cross-fertilizing plants. The work has not progressed far enough yet to show definite results. This farm is now in charge of the plant breeder as acting superintendent.

LA CARLOTA SUGAR ESTATE.

Under the direction to open up La Granja, the Spanish sugar estate, destroyed and abandoned during the revolution, about as much of the 1,200 acres or more of the estate is open as we have facilities to utilize. Some 200 acres of cane land and 100 acres more for feedstuff and other crops are now in cultivation. The poor milling arrangements found on the place will not handle more than 200 acres of fairly good cane. About 180 acres of cane on the place last year yielded a little over 235 short tons of low-grade sugar, the only kind the place is equipped for making. A rather disastrous cane fire occurred that reduced the yield and the quality of part of the product. Scarcity of labor at grinding time also caused some loss. The expenses were much less than the year before, but with the very low price of sugar, the product will not pay the cost. I doubt if, with the milling facilities on hand, we will ever be able to pay the expenses of opening and cultivating this place.

Practically all the horses and mules kept on La Granja died of glanders, and the whole province is so infested with glanders and surra that it does not look encouraging to provide any more. To do the work of cultivation with carabaos and cattle is slow and tedious and hauling to shipping point expensive.

Last year's crop contained a good deal of first ratoon cane, and some of this has been saved for second rattoons. Part of this was so poor that it was plowed up and the balance is unpromising. For some reason Negros planters have seldom been able to grow but one ratoon crop. They attribute the trouble largely to insect attacks.

I should very much like to see a modern sugar milling plant on this estate large enough to bring it all under cultivation. With mills and other facilities such as Java and Cuba discarded forty years ago, there seem now no profit, no progress and no hope in the Philippine sugar industry. There appears to be no private capital whatever likely to engage in the building of a modern mill or to open a modern estate.

RICE FARM.

The farm leased for rice culture at Murcia, Tarlac Province, has never been considered very suitable for the purpose. It is too rolling, too far from the source of irrigation water, and too poor for best results. The rolling nature of ground necessitated too many dikes to hold water on the rice, and these made machinery difficult and expensive to operate. The land is of a poor, sandy nature, and without careful culture would scarcely yield a crop amounting to anything.

The whole islands averaged about 800 pounds of rough rice per acre in 1902, or about half the average of the United States. For two years now quite good crops were produced on the Murcia farm, averaging about 1,000 pounds of rough rice per acre, though made at too high a cost.

Certain experimental results I consider of highest value. The native planter is certainly right in starting his rice in a seed bed and transplanting into freshly cleaned land. Otherwise his young plants are speedily choked out by coarse grasses and weeds. Americans have generally believed this plan involved a useless waste of time and energy. Generally our best crops have been gotten in this way. By sowing rice broadcast on the land where it is to grow, no crop at all is gotten unless it is carefully weeded. By sowing in drills 15 to 20 inches apart, so as to make weeding easy, crops nearly as good as the transplanted ones were gotten. We found that crops planted in May or June ripen little or no sooner than those planted in August or September, but the early planted crops yield immensely more than the later ones. In fact the season through which the most profitable plantings are made is so short that an immense force of laborers have to be had in order to plant even moderately large areas. Sowing in drills and at the same time starting seed beds for transplanting later, will lengthen the planting season somewhat. I believe with artificial irrigation seed may be planted a month earlier than is generally done and yet the crop will not ripen until the usual time and by having a longer season of growth will give a still better yield.

There is little doubt but that if the rice fields of the islands were kept clear of grass and weeds during the growing season the crops would average 25 per cent better. Much land is not well cleaned before planting, and then most of the fields depend on the rain falling on them for irrigation, which is not sufficient to keep the ground covered and the weeds and grass down. So most rice fields are partly choked out by other growth and the yield is reduced accordingly.

Dry season crops of rice, especially on poor soil, are not very satisfactory. They come to maturity quickly, but the yield is small and of poor quality. On rich, black soils fair crops of a rather poor grade of rice are secured with abundant irrigation. I must think that corn, Kafir corn, beans, or peanuts would pay better in the dry season than a short crop of rice. The last two crops would enrich the land for the main rice crop. Even the corns would scarcely exhaust the land worse than it generally suffers by growing a crop of coarse grasses and having these burned off each year. Of course, two or more crops of anything would generally involve artificial irrigation instead of depending on the natural rainfall.

EXPERIMENTS.

One experimental field of 15 acres was planted early in drills 20 inches apart, cleaned of grass and weeds with hoes, at an expense of ₱6 per acre. The yield was 24,000 pounds, or fully up to the United States average.

Another piece of 75 acres, planted early, in drills 15 inches apart, had its dikes

destroyed by a big flood, thus permitting the grass and weeds to gain considerable headway. Owing to scarcity of labor it could not be cleaned early. Dikes were rebuilt, grass and weeds were cut with knives and bolos, and water turned on to keep them down. The yield was 1,260 pounds per acre—about 52 per cent above the Philippine average.

Another piece of 60 acres, planted two weeks later and also cleared of grasses and weeds, yielded 1,000 pounds per acre. Worms cut this piece down to the water line late in August.

Young plants for a 6-acre piece were started early in seed bed. When about six weeks old the land was thoroughly plowed and cleaned and transplanted. No weeding or cultivation was given. Yield, 2,200 pounds per acre, or about 37½ per cent above the United States average.

Another piece of 40 acres was sown in cowpeas in March. These were plowed under, land prepared and cleaned, and transplanted a little later than preceding plat. This piece suffered from worms in August and locusts in September, but yielded 1,500 pounds per acre.

Another piece of 10 acres, treated as the last, except that no cowpeas were grown, yielded 1,200 pounds per acre.

Two and one-half acres were treated as the last, except that 600 pounds per acre of tobacco waste from the Manila factories were worked into the land while being prepared. The yield was 2,900 pounds per acre. This is probably a larger increase than this amount of fertilizer would generally give, but it indicates that a large amount of valuable fertilizer is going to waste at the tobacco factories.

Fifty acres were transplanted with plants sown in beds about six weeks later. They produced only 400 pounds per acre.

Rice growing has so increased in the Murcia neighborhood that labor could not be gotten in sufficient quantity the last season, and 180 acres were as much as three weeks late, with the yield cut off from 30 to 50 or more per cent.

Three different outbreaks of surra destroyed all the horses and mules formerly kept at this place. The plowing was all done by steam. Harrowing, seeding, and cleaning plowed land for transplanting were done with animals. When the ground is in proper condition of moisture, steam plowing is quite a nice proposition. It is less advantageous on old rice land, as a good many dikes have to be taken down and built up again at great expense. This difficulty is still more serious where the lands are somewhat rolling and dikes numerous. To reclaim new land and to plow for other crops than rice, steam power will possess its greatest advantages. Of course after the rains became heavy, the great weight of traction engines precludes the possibility of working them. Then, on most soils not provided with artificial irrigation, the land gets too hard to plow during part of the dry season. These difficulties, together with the great cost of these machines, make it certain that they will not come into very general use in a country where land is so much subdivided, however scarce animals may become from the several deadly diseases to be met with. The land in Cavite, where rice is being planted this year, proved to plow better when entirely dry than when wet. This will prove a matter of great advantage if this is found generally to be the case on all the volcanic soils of Bantangas, Cavite, and other provinces.

The cost of steam plowing seems to range from ₱3 to ₱6 per acre, owing to the situation with reference to fuel, water, and other conditions.

Experiments have been made with a much lighter and cheaper kerosene-burning engine, but so far not very satisfactory results have been gotten.

OTHER MACHINERY.

Several makes of small light rice hullers and polishers have been rather roughly tried. They have not been very satisfactory. They wear and break rapidly, and crush and injure the quality of the output. There seems to be too little metal in them to do the work claimed for and expected of them. Their rather general introduction has had one good effect. Several large rice-milling plants, all owned by one firm, have had competition, and prices for rough rice have been much better than formerly. We have heard general complaint about the work done by the small hullers. Reapers and binders combined have not proved so well suited to our conditions as the smaller and cheaper self-rake reaper. Thrashing by tramping the rice under feet of men and animals is quite slow, laborious, and wasteful. The steam-driven thrasher has frequently proved to recover 25 per cent more grain than is gotten under

the old process. If the rice provinces generally had good roads, thrashing machinery would certainly come into general use.

Rice production has grown greatly, especially in the central plain of Luzon from Manila to Dagupan and beyond, the last two or three years. It seems quite likely that in a few years there will be no necessity for importing rice into the islands, unless weather conditions should prove unfavorable. These conditions have certainly been favorable the last two years. Depending, as nearly 100 per cent of the people do, on the rain that falls on the fields to make what Louisiana people would call "providence rice," there is always danger that rains may fail, entailing serious results. Even with very largely increased crops, I would hardly look for any considerable exports of rice from here. Under present conditions, exported rice would have to sell at such a reduction from island prices, that people here would buy and consume a great deal more. The great majority of our rice is not suitable for export, even to China and Japan, and none of it would sell in the United States at all.

DIVISION OF ANIMAL INDUSTRY.

This division includes all work done by this bureau in the inspection and control of infective diseases of the domestic animals throughout the islands; the stock farm at Baguio, where experiments are being conducted in breeding horses, cattle, sheep, goats, and hogs; horse breeding throughout the islands, by the use of improved sires loaned to the provincial governments and private individuals; and the dairy farm, and hog raising at Manila.

CONTROL OF INFECTIVE DISEASES.

Rinderpest.—When the veterinary work was taken over from the board of health a severe outbreak of rinderpest prevailed in the beet-sugar growing section of Occidental Negros, where it had caused serious losses among the carabaos and cattle of that province. There was a scarcity of antirinderpest serum at that time which materially hindered the work of inoculation. The simultaneous method was being used with apparently good success. In a few instances a high rate of mortality was encountered, which proved to be due to complications of surra and hemorrhagic septicemia. This made it necessary to suspend the use of the simultaneous method before the outbreak was fully under control, but by the use of serum in and around the infected centers, the disease was well under control by the end of December. The only other outbreak of importance which prevailed at that time was in the province of Zambales. Simultaneous inoculation was used there with good success. So far as known only a few scattered cases occurred in widely separated districts during the five months following January 1, the principal provinces affected being Misamis, Occidental Negros, Albay, and Bohol. Most of the smaller outbreaks were readily suppressed by serum inoculations given to the affected and exposed animals and those in the immediate vicinity. Quarantine measures were enforced as far as practicable, but in the absence of any general law making veterinary sanitary measures compulsory, reliance had to be placed principally in provincial and municipal officers.

The governors, provincial and municipal boards, presidentes, and local officers of the bureau of health have rendered valuable assistance in locating infected centers and suppressing infective diseases.

During the eight months covered by this report, 5,780 cattle and carabaos have been inoculated, and 245, or 4.23 per cent, of these died subsequently from rinderpest. From the statistics available, the exact number of animals suffering from the disease at the time of inoculation can not be determined, but practically all of the deaths were among animals receiving serum as a curative agent. In most cases where the animals were not sick or did not develop the disease in one or two days after the inoculation the serum protected them against a fatal attack. However, it should not be overlooked that in inoculating animals in these islands by either method, a great many of these animals are likely to be immune from previous outbreaks of rinderpest. Therefore, we should be careful not to claim credit for saving all the animals inoculated that fail to contract the disease. In Germany a few years ago it was reported that inoculation with virulent blood was abandoned because losses were as high as 25 per cent, and because it spread the disease.

Of our inoculations 4,961 head received serum only, with 152, or 3.08 per cent, subsequent deaths; 685 received simultaneous inoculations, with 80, or

11.69 per cent subsequent deaths; 134 head received virulent blood following about ten days after the serum inoculation, and of these 13, or 9.6 per cent, died subsequently of rinderpest.

In considering these figures it should be remembered that a much larger number of animals were inoculated with serum only than by either the simultaneous or deferred methods; that the bulk of the animals receiving serum only were never exposed to the disease; and that all of those receiving simultaneous or deferred inoculation are given a cubic centimeter, or more, of virulent blood, which produces a genuine case of rinderpest and would in most cases prove fatal but for the serum preceding or accompanying the blood given. On the other hand, all animals suffering from the disease at the time of inoculation are included in those receiving serum only, and it is among these that the heaviest death rate occurs; while all animals given simultaneous or deferred inoculations are judged to be free from rinderpest at the time the virulent blood is administered. It has been observed that animals suffering from surra, hemorrhagic septicemia, foot-and-mouth disease, or Texas fever, die readily from rinderpest contracted either by natural infection or virulent blood inoculation simultaneously with any of them. As the first three frequently exist in communities where rinderpest has appeared, it becomes impracticable to give any form of virulent blood inoculation without first eliminating all of these diseases as complications. This is very difficult in the cases of surra and hemorrhagic septicemia. Texas fever is of no importance with native cattle, as they are generally immune to it, but has been a serious complication in imported nonimmune cattle, especially from the Northern States and southern Australia. The virulent blood taken from native animals to inoculate the imported cattle against rinderpest precipitates a case of Texas fever soon after the rinderpest reaction has occurred.

The principal advantages of the serum method of inoculation are that it is easily and quickly administered by any person of ordinary intelligence after a little experience. An inoculator can cover a large territory in a short time; it imparts a temporary immunity which usually protects the animals until an outbreak can be suppressed; it meets with popular favor, which is essential; it can not produce death and may be given indiscriminately to animals suffering from the disease, exposed to it, or free from it; serum will save the lives of a large per cent of animals in which rinderpest has already developed; draft animals may continue at work after inoculation; it requires less serum than the deferred method; and it is the cheapest method for a given number of animals.

Some of its disadvantages are that the immunity produced by serum is only temporary; the animals are liable to contract rinderpest if exposed to it after the lapse of three or four months unless inoculated again; and it requires more serum than the simultaneous method.

The principal advantages of the simultaneous and deferred methods are that they impart permanent immunity to the animals inoculated; it increases the value of the animals because they may be herded or driven where they will be exposed without fear of contracting rinderpest; they are not nearly so liable to carry the infection as nonimmune animals; they may serve as a barrier against the spread of the disease where a large number of immune animals exist in a community.

Some of the disadvantages of these two methods are the high rate of mortality which follows the inoculations; they are purely prophylactic and can be used only with noninfected animals; can not be practiced with safety where other infective diseases exist as complications; slow and tedious of administration, requiring the services of a skilled veterinarian; both methods are more expensive for a given number of animals than the serum method, and if an attempt were made to immunize all the bovine animals of the islands the cost would become prohibitive; they are not in favor among the people and would have to be enforced by legal processes; danger of further spreading the disease, as each animal receiving virulent blood carries the infection and must be kept in quarantine until fully recovered.

Under the conditions which prevail in these islands the serum method promises best results for general use. The simultaneous method may be used to advantage where the country is densely settled and the animals concentrated in large numbers, provided no complicating diseases prevail at the time of inoculation. The deferred method is practical only with small herds of valuable animals, such as imported dairy cattle, and where complications might follow the simultaneous method.

Surra.—This disease has been reported from a number of provinces, but the outbreaks have generally been small. It has been most serious among military and civil government horses, and along roads where large numbers of ponies are used for transportation, such as packing copra. The most severe losses have been reported among the provincial horses used for road work in Tayabas; farm horses used on the government rice farm in Tarlac Province; city horses in Manila; constabulary horses in the central provinces of Luzon.

Among the private losses may be mentioned pack ponies in Laguna Province; carromata ponies in Capiz and Iloilo provinces; carabaos, cattle, and ponies in Negros. A number of cases have been reported from other parts of the islands, but were generally limited to not over half a dozen cases.

Glanders.—This disease is often met with, but its progress is slow and the infected animals so widely scattered that but little could be done except to diagnose the cases which had developed clinical symptoms and place them in quarantine, the enforcement of which had to be placed in the hands of local officials until the animals died or the owners consented to destroy them. Mallein tests were made on a limited number of horses.

Foot-and-mouth disease.—This is frequently observed in Manila and other ports where cattle are shipped in and out by steamers and where large numbers of cattle and carabaos are kept in corrals or used on the streets and roads. While it proves very serious for American and Australian cattle, the native cattle and carabaos generally make a good recovery, except for an occasional case of chronic lameness. It has not been serious except as a complication with rinderpest in a few cases.

Other diseases.—Hemorrhagic septicemia, hog cholera, anthrax, and contagious lymphangitis have been reported a few times, but none of them have existed in extensive outbreaks or caused serious losses.

PORT AND CITY INSPECTION, MANILA.

All animals arriving in Manila from foreign and interisland ports and inland points are inspected for contagious diseases. The following inspection fees are charged the owners:

	Per head.		Per head.
Horses -----	₱1.00	Sheep -----	₱0.20
Carabaos -----	.40	Goats -----	.20
Cattle -----	.20	Other animals -----	.40
Hogs -----	.10		

A certificate is given with each lot stating the kind and number of animals inspected, whether or not they are free from disease, and the amount of fees collected. If dead animals arrive on board ship, a permit is issued to land same for cremation. Health certificates are given with animals shipped out of Manila.

During the period from November 1, 1905, to June 30, 1906, sixty-two thousand one hundred and seventy animals arriving in the port and city of Manila were inspected, for which the sum of ₱9,865.90 was collected as inspection fees.

Of the total number inspected on arrival at the port, 21,470 were from foreign ports and 40,700 from interisland ports. The bulk of the foreign cattle came from South China, Saigon, Borneo, and Australia.

One thousand two hundred and twenty-two animals were inspected for shipment to the provinces.

Six thousand two hundred and thirty-nine animals have been inspected for surra and glanders, with 15 horses and 1 cattle positive to surra, and 50 horses positive to glanders. Microscopical examinations were made for surra, and when diagnosis of glanders was doubtful the mallein test was applied.

Thirteen thousand two hundred and twenty-two cattle, 35,340 hogs, 5 sheep, and 1 goat were inspected at the public abattoir. Both ante and post mortem inspections were made. Forty-five cattle and 73 hogs were condemned as unfit for human food and cremated. The cattle were condemned for tuberculosis, rinderpest, and general debility. The hogs were condemned for cysticercus and hog cholera. Eleven thousand four hundred and forty-three parts of carcasses were condemned for various inflammatory processes.

A general canvass of all the stables in the city was made from January 1 to June 1 of the present year for the purpose of ascertaining as near as possible the extent of the prevalence of infective animal diseases in the city. The stables of many districts were visited from one to half a dozen times when disease was

suspected. The result of this work enables us to report that Manila is now freer from animal infective diseases than it has been at any time since the American occupation.

Difficulties.—The inspection, suppression, and control of infective animal diseases in these islands are attended by many serious obstacles. Transportation between nearly all important ports is by boat, and at several points where rinderpest has prevailed this year the boats call only twice a month. Travel inland is often very slow on account of the necessity of transporting supplies on bull carts over bad roads and over trails by packers.

The difficulties are greatly increased by encountering swollen streams without bridges during the rainy season when rinderpest is most prevalent. With a force of men necessarily limited and the necessity for reaching distant islands and difficult inland points with necessary supplies, outbreaks often have time to spread considerably before men and supplies can be gotten to the location. The reports of diseases made to the Manila office often assume two extreme forms. On one hand the death of three or four animals from any cause is reported as a severe epizootic, and help urgently demanded. In other cases scores of animals have died in a densely settled section where mail, telegraph, and telephone were available, but no report made. In some cases the owners of affected animals have suppressed information regarding them or refused to have them inoculated and placed in quarantine. There is no specific law under which animals suffering from infective diseases may be destroyed or an effective quarantine enforced.

STOCK FARM, BAGUIO.

The stock farm has been transferred from the former temporary location at Pacdow near the sanitarium to the Little Trinidad Valley. It is located on an Igorot claim of about 17 hectares, and the adjacent hillsides have been fenced in with it so as to make about 40 hectares in the inclosure. The buildings erected are a cottage to be used as a residence by the superintendent, large barn for the American horses, small barn for the ponies and burros, blacksmith shop, wagon shed, cattle barn, and quarters for the laborers. All of these buildings are constructed of Benguet pine, and all but the cattle barn and laborers' quarters have galvanized-iron roofs. The water supply is taken from a spring in the hillside about 300 yards from the main barn and flows through a galvanized-iron pipe line with a fall of about 18 feet. The buildings were completed and the stock moved over to the new location the 1st of June. This farm is now practically as well equipped as a good stock farm in the United States. One of the greatest difficulties encountered is the transportation of feed and supplies, which is slow and costs 4 cents per pound from Dagupan.

The stock now on the farm consists of 4 American stallions, 15 American mares, 13 native mares, 15 colts, 20 burros, 73 head of cattle, 7 head of sheep, 3 head of Angora goats, and 5 hogs.

On account of the extremely dry season during February, March, and April, and the prevalence of forest fires, the grass was largely destroyed in the vicinity of Pacdow, where the animals were kept at that time, and they lost considerable flesh. Green forage was brought from the Trinidad farm, 4 miles away, by burro pack train until the new place could be used.

After the rains, early in May, abundant grass sprang up and the stock has done well since that time. The animals have all been remarkably free from diseases of all kinds, except that 4 cows are reported as having died from anthrax. The diagnosis seems to be somewhat doubtful on account of the fact that cultures were not made and that the disease did not spread further.

All of the American mares have been bred and 4 of them have colts. Three aborted, supposedly from eating young pine seedlings on the range during the dry season; one colt was born dead and one died when 12 days old from suppressed urination. Three of the native mares have foals by the Arabian stallion Bedr, 3 aborted, and all of them have been bred.

Seventeen of the 54 Chinese cows have calves, 9 of which were sired by an imported Galloway bull and 8 by Shorthorn and Jersey bulls.

The sheep and goats were only sent up in April, and have done well so far.

The Kentucky saddle horse, Montgomery Chief, jr., is too large for service with native mares, and on account of the fact that this bureau is seeking to breed small to medium-sized stallions for service with native pony mares, he

has not been used for service on the large mares at the stock farm. He has served 2 army mares.

The Arab stallion Bedr has served 40 pony mares belonging to private parties and has 5 colts already foaled from this number.

The Galloway bull runs with the farm herd of cattle on the range and has been bred to 21 cows belonging to private parties. Seven of these have calves.

The Berkshire boar kept at the farm was sent there in February. The Igorots have been bringing in their sows to be bred. A few litters of good pigs sired by him have already been farrowed.

The breeding operations of this farm have not gone far enough yet to show any definite or positive results, except that all of the animals seem to be entirely exempt from the severe infective diseases which prove so destructive in the densely settled low coast country.

The colts sired by American horses and out of American mares seem very promising, and those out of native mares and sired by the Arabian horse give promise of improved size and form.

The calves sired by the American bulls show a remarkable tendency to follow the type of the bull rather than their dams.

The deaths among the animals have been largely by accident. Two cows died of acute laminitis after being driven over the road from Dagupan to Baguio; 1 fell over a cliff; 1, cause unknown; and 4 from what was supposed to be anthrax. During the severe typhoon of May 18, 1 cow, 8 burros, and 11 burro colts were drowned in the swollen streams that filled the canyons in which they were grazing. It is thought that the new stock farm is so located as to be free from forest fires in the dry and the danger of floods in the rainy season.

The 11 American stallions, mostly Morgan and Arabian, have been distributed to various islands and provinces during the year. Some of them did not do a great deal of service, showing that there was not the demand that had been believed to exist in these particular localities. Others were much in demand. The belief generally prevailing at first that delivering foals sired by American horses would kill the small native mares seems to have been groundless. Some 250 services have been reported during the year and a large number of nice colts have been foaled.

DAIRY FARM.

At the beginning of this fiscal year there were on hand 13 American and Australian cows, 7 heifers, and 1 young Jersey bull.

The following Australian cattle, mostly grade Shorthorn, have been purchased during the year: Seven yearling heifers, 10 cows and calves, 11 calves 2 to 6 weeks old, 5 young bulls, and 22 heifers 5 months to a year old.

In view of the serious losses previously sustained from rinderpest these purchases were regarded as largely experimental with a view to immunizing them to the disease and adding all that survived to the dairy herd. The first 7 heifers were received from Townville, Australia, in December, and were covered with ticks, showing them to be immune to Texas fever. They were given a prophylactic dose of 100 cubic centimeters of serum, and ten days later received simultaneous inoculation with one cubic centimeter of virulent blood. Five reacted promptly and recovered. The other 2 failed to react, were given 2 cubic centimeters of virulent blood, reacted, and recovered. In thirty days after arrival they were ready to go out with the dairy herd as immune animals.

The 10 cows and calves were received from Sydney in January and were not immune to Texas fever. They were given a protective dose of serum, placed in quarantine until the calves were about 6 weeks old. They were then inoculated against Texas fever with a loss of 1 cow. After suffering some loss from other causes the remaining ones were successfully immunized against rinderpest.

The 11 young calves were bought from dairymen in Manila with a view to determining whether or not young calves could be immunized against rinderpest easier than grown cattle. It was necessary to remove them to the serum laboratory and feed them on canned milk. They soon became thin, and 3 of them died from gastritis. The remaining 8 were successfully inoculated against rinderpest.

Forty-seven head of these cattle in all received both the Texas fever and rinderpest inoculation during the hot dry weather of March, April, and May. When the reactions occurred with temperatures of 40 degrees Centigrade or over, they suffered greatly from the heat and artificial refrigeration by bathing became necessary. They became thin and anæmic after the double inoculation and have not done as well as desired.

The dairy herd now numbers 1 bull, 26 cows and heifers, 12 yearling bulls, 18 young heifers, and 7 heifer calves, making a total of 64 head. All of the cows and yearling heifers have been bred and in six months we should have 20 to 25 cows in milk.

Now that the bureau has a fair dairy herd of immune cattle, it is expected that during the coming year more satisfactory results can be gotten.

It is recommended that the herd be removed from the present temporary location to a permanent site out of Manila and preferably on the Antipolo branch of the Manila and Dagupan Railway where the transportation facilities are good.

HOGS.

The hogs on hand at the beginning of the year consisted of 1 Berkshire boar, 6 sows, 2 pigs, and 2 native sows with 7 half Berkshire pigs. They were all kept in closed pens at the Singalong experiment station until December, when a new hog house was completed. It has cement floor and galvanized-iron roof, with wide, overhanging eaves. It contains 8 stalls suitable as farrowing pens and for sows with litters of pigs. The floors of the stalls slope to gutters in the passage which drains out at the end of the building and away by cement drain. The walls consist of a board at the top and bottom, and the space between them is filled in with heavy poultry netting, thus providing free circulation of air. Water is supplied in the building. A runway of about half an acre adjoining the house is inclosed by a board fence and cut into three lots which are shaded by clumps of bamboo, and wide, shallow bath troughs are provided with shower baths over each. Ten Berkshire pigs, 4 boars, and 6 sows have farrowed and raised 12 nice pigs. We have raised a number of crossbred pigs that look to be a great improvement over the native hogs of the islands.

The herd now contains 46 head. They have been fed on rice polish, corn, and green feed; have been remarkably free from disease and have done well. It is recommended that in case a new location for the dairy farm is selected, about 20 brood sows be placed there and an effort made to supply the increasing demand for well-bred pigs all over the islands.

PERMANENT IMPROVEMENTS.

The following improvements have been made at the Singalong experiment station, Manila:

In order to properly house the machinery and implements from the rice farm, a shed was built 26 by 68 feet. It is inclosed on three sides and has a galvanized-iron roof. It was built principally from materials shipped from the rice farm.

The pipes formerly in use covered only a small portion of the grounds. During the early part of the dry season the system was remodeled, 3-inch mains laid to each of the four blocks of the station and smaller pipes connected with these so as to reach all parts of the grounds and furnish water for stock and house use. A new 6,000-gallon tank was put up near the old one, which had been partly destroyed by fire and has been removed. An air-lift pump will be installed before the next dry season.

Alterations to barns.—That part of the small camarin formerly used as a wagon shed has been inclosed by a wall, and the floor of this new part and the hall way cemented. This adds greatly to the storage capacity of this building. The large barn has been changed by removing the pigpens, cutting off a machinery room across one end, reducing the number of tie stalls to eight and putting in four box stalls. The floors of the machinery room, hall way, and tie stalls were cemented and a gutter put in so as to take all of the drainage from the stalls to a sewer pipe which empties into an estero below high-tide level.

The nipa potting shed used by the horticulturist has been removed from the vicinity of the barn and placed in a more favorable and secluded location at the back of the grounds, where much of the propagation work was being done.

The old nipa house formerly used as a residence by the superintendent became so dilapidated that it was torn down the last week in June. Plans have been prepared for a modern cottage to replace the old one and work thereon commenced.

A new survey and map of the grounds showing the new streets has been made by the bureau of lands. A small parcel adjacent to private lands fronting on Third avenue between G and H streets was sold by order of the Philippine Com-

mission. A lot of native shacks on the west side of the grounds were removed and the land put into cultivation out to the proposed line of G street. A macadam road was built from Calle San Andres to the barns, a driveway put in around the buildings, and a yard for wagons and implements opened up where the old potting shed stood. The road, driveways, and yard are covered with fine sea shell dredged from the bay and a cement watering trough provided in the center of the wagon yard. A line of trees has been planted on each side of H street and on the north side of Calle San Andres.

SANTA CRUZ, CAVITE.

Implement shed.—When this bureau undertook to do steam plowing and thrashing for renters on the large friar estates in Cavite Province it became necessary to provide a building in which the engines, machines, and implements could be stored during the rainy season. It was located in Santa Cruz, on a lot just back of the local office of the bureau of lands. It is a frame structure with galvanized-iron roof and ventilated for its full length. One side consists of four large double doors capable of admitting a traction engine or thrashing machine. A room for the storage of tools and small supplies was also fitted up in the adjacent building occupied by the bureau of lands.

RECOMMENDATIONS.

I think the bureau and the islands have progressed to a point where a general experimental station after the order of those in the United States and Europe is demanded.

So far, the stations and farms have been largely in the nature of demonstration farms or object lessons. They have not been equipped or officered in a way to get the most in the shape of accurate experimental results suitable for publication and general distribution for their educational effect on the whole people. Only a comparatively small number of people can witness any demonstration in progress. An infinitely larger number not confined to any one locality may read and study results and receive benefits. I believe the education of the islands has progressed far enough to make it highly important that we pay more attention to getting accurate scientific information for more general distribution. The bureau of education is even now calling for our bulletins by thousands for distribution to their pupils.

I recommend the establishment of an experimental station for work with the staple crops of the islands especially, situated so as to have easy communication with Manila and yet be far enough away from the seacoast to expect good results with tobacco. So far nothing of value has been done by the bureau with tobacco, yet this formerly great crop is deteriorating every year in quality and not increasing in quantity. It is losing market after market, and its very existence as an export product is being threatened with extinction. To fulfill the requirements of the tobacco crop the station would need to be as far away as San Isidro or Cabanatuan. The same soil suitable for tobacco is considered fair for sugar cane, as well as being good for corn, sweet potatoes, cassava, pineapples, maguay, and most other crops. Adjacent to such land will nearly always be found the black sedimentary soils best suited to rice. Experimenting with this, the greatest of all crops of the islands, should always be prosecuted with vigor. We have literally hundreds of varieties not yet studied, and the diseases of rice have not been more than touched.

Sugar cane, its growth, fertilizer requirements, and saccharine richness could here be studied. A branch laboratory for this and other purposes would need to be had. Its equipment, reagents, and, if need be, its chemist, could be drawn from the laboratory of the bureau of science. With such a station and equipment the digestibility of all island food-stuffs could be experimentally determined, something no bureau is prepared to do now.

With a suitably situated station containing 200 to 300 acres of land, small plot results as well as field results on several acres to check them could be gotten. Abundant means for irrigation is a requisite for best results under our conditions.

To enable these recommendations to be carried out I would recommend the sale of the trial grounds in Manila, amounting to about 10 acres. According to prices recently offered for a small part of this land it should all bring well

over ₱100,000. It is being so cut up by streets as to become very inconvenient. The area is so contracted that general accurate experimental results can not be counted on. People have built around this place so generally that fowls, dogs, and servants depredate to such an extent that accurate experimentation is impracticable.

I believe the sale of this property would buy and thoroughly equip such a station as I have recommended and then save half the money.

DIVISION OF STATISTICS AND CROP REPORTS.

It is recommended that an earnest effort be made to learn more about the crops, live stock, and conditions of the islands, and to that end that a division of statistics be organized.

One of the great difficulties always confronting one in the Philippines is the small amount of information to be gotten and its generally conflicting character. Very few people seem to know how much land they cultivate, what it yields, and what they get for the crop. To assist the statistician, who should also be more or less of a traveling inspector, it is planned to have 6 agricultural inspectors who shall be graduates of agricultural colleges or have similar qualifications, and 6 assistant agricultural inspectors. About this number of men is now being maintained for the sole purpose of inspecting, inoculating, and quarantining animals exposed to infective diseases. For perhaps more than half the time these men have nothing to do. By giving them the additional duty of inspecting and learning about the crops, the lands, the water supplies, crop pests, prices of products, etc., and reporting them, as well as handling animal diseases, their services may be made much more valuable.

Very respectfully,

W. C. WELBORN, *Director.*

The SECRETARY OF THE INTERIOR,
Manila, P. I.

APPENDIX G.

REPORT OF THE DIRECTOR OF THE WEATHER BUREAU.

WEATHER BUREAU,
Manila Observatory, July 15, 1906.

SIR: The period July 1 to August 31 being covered by the preceding annual report, rendered during my absence on leave by the acting director, may be omitted here, except as far as it affects the expenses of the weather bureau during the past fiscal year.

Although the weather bureau as constituted by the reorganization act was found not to differ materially from the Philippine Weather Bureau created by act No. 131, still, in view of the various changes in the laws governing the insular bureaus, it was considered inconvenient that the director of the bureau should be absent. Therefore it became necessary for me to return from Europe one month prior to the expiration of the leave of absence (January 11, 1906) granted to me and to again assume charge of the bureau on December 18, 1905.

The fact that I made the trip in an official capacity appears to call for a short report of same.

I. OFFICIAL TRIP TO EUROPE.

1. OCCASION OF THE TRIP.

In February, 1905, I received an invitation from the permanent International Committee on Meteorology to attend the International Congress of Directors of Meteorological Services, which would begin its sessions on September 9, 1905, at Innsbruck, Austria. For two reasons this invitation would not well be declined: First, nine years had passed since the last congress of this nature had met at Paris (1896); hence it was to be expected that important questions would come up for discussion; secondly, it seemed very desirable that the weather bureau of the Philippine government be represented. An additional inducement was the occurrence of a total eclipse of the sun on August 30, 1905, and the invitation of the director of the new "Observatorio del Ebro"—a former member of the meteorological service of the Philippines—to observe the phenomenon at his institution, which, being near Tortosa, was well within the zone of totality.

In order not to cause any expense to the Government, I determined to take the trip while enjoying the leave of absence accrued during five years, and hence at my own expense. His excellency the governor-general issued a diploma commissioning me to represent the weather bureau officially at the congress, and another document from the honorable secretary of the interior gave similar authorization for observing the eclipse, and requested from the Spanish authorities the privilege of free entry into Spain of the instruments for said purpose.

2. THE TOTAL ECLIPSE OF THE SUN, AUGUST 30, 1905.

Upon my arrival at Barcelona, August 16, I found that a royal decree had already been issued granting the last-mentioned privilege. The instruments which I had brought with me from Manila were for the greater part meteorological, the most important being a double thermograph, rebuilt by our mechanics, for registering on one cylinder, revolving with rapid motion, the temperature of the open air, one pen giving the temperature in the sun the other in

the shade. Other important instruments were an Eliot magnetometer for the study of the variations of magnetic declination and a phototheodolite to which had been fitted one of the long focus lenses of the reflecting zenith telescope.

While in Barcelona, I was urged to accept the direction of an eclipse party composed of professors of the Jesuit College at Barcelona, which at the earnest request of the Right Rev. Bishop of Palma de Mallorca, Balearic Islands, was to observe at said place, the bishop offering every facility and even to defray the expenses of the trip. I accepted, and left for Palma together with four professors of the college of Barcelona and one from Tortosa. The prelate placed at our disposal his palace, the seminary, and any number of assistants that could be desired. A very welcome addition to our instrumental outfit was a telescope of 15 centimeters aperture belonging to the seminary. For accurate time we depended on a pocket chronometer and a fine ship's chronometer, purchased in Barcelona, which we compared with the time signals given by H. B. M. S. *Venus*. The latter had brought an English party under the direction of Sir Norman Lockyer to Palma.

The observations secured during the eclipse proved satisfactory. An account of their nature and results will be published in one of the volumes of the report of the weather bureau for 1905.

3. THE INTERNATIONAL METEOROLOGICAL CONGRESS.

On September 7 I arrived at Innsbruck, together with the director of the Zikawei Observatory, Rev. Louis Froc, S. J., whom I had joined at Paris. After some official visits, especially to Professor Pernter, director of the Austrian Meteorological Service, and to Professor Hildebrandsson, secretary of the International Committee (the chairman being absent on account of illness), we settled down for the immediate preparation for the congress. The latter opened on the afternoon of September 9. Without doubt it was the most important meteorological gathering ever held (Leipzig, 1872; Rome, 1879; Munich, 1891; Paris, 1896), on account of both the number of countries represented and of the importance of the discussions. For the records of the congress I refer to the "Proceedings," published in French and German, and to the "International Manual of Congresses." For the preparation of the latter and the discussion of international comparison of the standard barometers of the different meteorological centers the congress appointed a committee of which the representative from the Philippines was elected chairman.

The 49 delegates represented the following countries: Germany (various States), 12; Austria, 9; France, 6; Sweden, 4; Great Britain, 3; Russia, 2; United States of America, Canada, Belgium, Denmark, Hungary, Italy, Norway, Roumania, Egypt, Brazil, British India, China, and the Philippines, 1 each.

After the congress had adjourned I attended to some business. In Germany I ordered a new standard traveling barometer (Fuess in Berlin), which is to serve for comparing the barometers of the secondary stations. At Liverpool I purchased an excellent chronometer, which is likewise to be used on trips of inspection. On account of circumstances already mentioned I returned to Manila earlier than I had contemplated, arriving at home on December 14, 1905.

It will doubtless be gratifying to you to learn that at the meeting of the Royal Meteorological Society (London), held on January 17, 1906, the director of the insular weather bureau was elected an honorary member of said society (number limited to 20), and this without any steps on his part to secure the honor.

In reporting the work of the weather bureau I shall, in general, follow the outlines of the previous annual report.

II. MANILA CENTRAL OBSERVATORY.

1. DEPARTMENTS OF THE CENTRAL OBSERVATORY.

(a) *The metrological department.*—From the nature of a central office of the meteorological service it is evident that the work of this department could not offer any great variations from that performed during previous years. No material changes have been made in the equipment or in the methods. The same as last year, at least one observer was on duty from 6 a. m. to 7 p. m., Sundays and holidays included.

The typhoon of September 22–28, 1905, threatened seriously to handicap the central observatory, as telephonic communication was destroyed, and the city

authorities could not be prevailed upon to permit at least the reestablishment of the line to the observatory, and thus to enable the latter to communicate with the semaphore. Lieutenant-Colonel Thompson, chief signal officer of the Philippines division, had no sooner been informed of our predicament than he ordered the installation of a military telephone at the observatory. In this connection I beg to bring to your notice the similarly generous action of the Eastern Extension, Australasia and China Telegraph Company. The storm having interrupted the government lines to the south, the manager of this company offered to transmit free of charge the weather dispatches from all points reached by its lines, as it does throughout the year with regard to the dispatches from Cebu and Bacolod.

Number of barometers observed and, when necessary, corrected, 315. Number of telegraphic typhoon warnings sent to China and Japan, 23.

(b) *The astronomical department.*—The work of this department has been confined to the furnishing of accurate standard mean time and to the daily observation of sun spots in connection with magnetic work. It has not been feasible to commence original research; but things are gradually being prepared to undertake such work.

The number of chronometers compared and rated was 39. On two occasions chronometers belonging to cable ships lying in the harbor of Guam have been compared by cable.

(c) *The seismic department.*—The new microseismograph mentioned in last year's report has not yet been installed. Since it is even more sensitive than the original Vicentini instrument, it would doubtless be interesting to have it in operation; but the amount of work involved in the daily preparation of the paper and the subsequent measuring of the records is such that it is hardly compensated by the advantage of a duplicate set of records. Mounted in some other part of the archipelago the instrument would be of great value.

During the period covered by this report Manila experienced 10 "local" earthquakes. Two of these produced some consternation among the inhabitants (though they were entirely harmless); the rest were merely "perceptible."

The seismological stations scattered throughout the islands reported during the same period 141 perceptible quakes, none of which had serious results.

The microseismic disturbances registered on the Vicentini instrument numbered 274. Of these 59 were due to earthquakes in the archipelago, 33 to "far distant" earthquakes, and the rest were microseismic tremors pure and simple. Of the far distant disturbances thus indicated by microseismic waves at Manila, the one which began to manifest itself January 31, 1906, at 11 h. 55 m. 34 s., p. m., proved to be the earthquake of Colombo, whose center was at a distance of 18,000 kilometers (=11,180 statute miles), while the tremors which commenced to affect the instrument on April 18, 1906, at 9 h. 22 m. 42 s., p. m., were due to the earthquake which resulted in the destruction of the beautiful city on the Golden Gate. Distance, 11,297 kilometers, or 6,950 statute miles.

(d) *Magnetic department.*—Last year's report exhibited the disastrous effects of the Manila Electric Railway upon the magnetic observatory. These notwithstanding, as stated there, the magnetographs were continued in operation with a view of studying the ever-changing effects of the electric traction currents and in the hope that at least severe magnetic disturbances would be recognizable on the records, and thus the weather bureau could contribute at least something to the international study of magnetic phenomena. The results obtained proved to be discouraging. It is true, in spite of the wild movements of the magnets, continually varying with the number of cars within the radius of action, with the distance of each of them, with its direction relative to the observatory, and with its load, the principal magnetic storms could be detected on the photographic records, even during the hours of heaviest traffic. Thus the great magnetic disturbances of July 5-7, August 2, September 18 and 19, November 12-17, 1905, and several of minor importance could be traced. But it was found impossible to disentangle from the mass of fluctuating influences the absolute values of the deviations of the magnets due to the magnetic state of the earth. Hence the observations have been finally abandoned at the beginning of the present year, 1906.

Manila observatory would willingly defray the heavy expenses of transferring the magnetic observatory to "El Mirador," a hill within the city limits of Baguio, Benguet, recently purchased, if we had the certainty that the projected railroad to the health resort will not be electric. The line, if constructed along the Benguet road, will approach to within 5,500 feet of the summit of Mirador, while if built via Naguiliang it will pass at even a smaller distance.

Hence it would be imprudent to expend thousands of pesos with the possibility of having the new observatory ruined within two to five years.

(e) *The mechanics' shop.*—No new constructions have been carried out by the mechanics during the past year, but they have been kept busy with repairs. There has been a slight falling off in the amount of repairs requested by other bureaus to be executed by the mechanics of the weather bureau. For some time the work of the mechanics was somewhat hampered in consequence of an agreement with the director of the bureau of science, according to which one of the most efficient mechanics, Mr. Román Trinidad, reported three times per week at the bureau of science for work during the forenoon. It had been expected that the splendidly equipped machine shop of said bureau would be of great service to the weather bureau, but this hope has not been realized, since there is rarely a piece of work to be done which calls for the prolonged use of machine tools, and on the many occasions when such appliances are necessary for short periods too much time would be wasted in going to and returning from the bureau of science.

The crop service.—The crop service has been continued on the old lines. The abolition of the franking privilege has made it more difficult to gather the necessary information, since on the one hand contributors can hardly be expected to pay postage on their communications, and on the other it is not feasible to send stamps together with the interrogation sheets, as many thus questioned do not reply.

No action has been taken by the authorities relative to the plan of a more extended crop service proposed in last year's report. Nor do I believe that under the conditions prevailing at present anything can be done to improve this service, highly deficient though it be.

2. IMPROVEMENTS AT THE CENTRAL OBSERVATORY.

(a) In order to facilitate communication between the astronomical department and the main building a bridge has been constructed connecting the second floor of the latter with the terrace of the former. Besides its usefulness, the structure also improves the appearance of the buildings.

(b) The motors purchased last year having been rendered useless by the substitution of the 220-volt current of the new company for the 110-volt current of the Electricista, three of them have been replaced by new ones adapted to the new style of current.

(c) As already stated, two new chronometers have been acquired for the observatory, one of which is a standard of excellent quality.

The same as in former years, all improvements have been made at the private expense of the observatory.

3. PUBLICATIONS.

(a) *Ordinary publications.*—Besides the monthly bulletins, Part III of the annual report for 1903, embodying the observations made at the secondary stations during 1903, has been distributed. Of the report for 1904 Parts I and II are in the hands of the printer, while Part III is in preparation.

(b) *Special publications.*—No special publication has been issued during the past year, unless the exhaustive monograph on the "Cantabria cyclone" (September 22-28, 1905), by Rev. Miguel Saderra Mata, assistant director, be considered as such. It was published in connection with the bulletin for September, 1905, but in order to meet the heavy demand foreseen for same 500 reprints of the English text and as many of the Spanish version have been made. The handsome pamphlets (57 pages text, 5 pages plates, 7 single and 2 double page charts and diagrams) have been greatly appreciated by the recipients.

III. THE SECONDARY STATIONS.

1. STATIONS IN OPERATION, JUNE 30, 1906.

(a) *Official stations.*—On June 30, 1906, 51 official stations of the meteorological service were in actual operation, viz, 7 first-class stations, 9 second-class, 25 third-class, and 10 rain stations. These are, in general, the same which were enumerated in last year's report, where their geographical distribution was given. The following changes, however, have been made: The third-class station at Masinloc, Zambales, has been given up, as it was impossible to secure an observer. The second-class station at Bolinao, Zambales, has likewise been

suppressed, and the rain station formerly at Marilao, Bulacan, has been transferred to Malolos, the capital of the province, and raised to class three since the latter town has telegraphic communication with Manila. These two changes are in accordance with the plan for a new distribution of the meteorological stations, of which I shall speak later.

(b) *Voluntary stations.*—The number of voluntary stations has slightly increased during the past year, although two of them ceased to exist. The typhoon in September caused the abandonment of Malahi Island, Laguna de Bay, by the army, whereupon the meteorological instruments were returned to the bureau in good condition. Mr. Perry P. Thompson, teacher at Echague, was transferred before he could do much work for the weather bureau. Experience has taught this office that it is a useless expense to furnish instruments to individual teachers. The changes are altogether too frequent to obtain good results from such stations.

Greater stability is expected of the voluntary station established in connection with the provincial school at Dumaguete, Oriental Negros. Other sets of instruments have been furnished, as follows: The United States army posts at Malabang and Parang-Parang, the honorable governor of Mindoro (two sets, for use at different places), the penal colony on Palawan Island, and St. Rafael farm, on the island of Basilan. A set of instruments, the private property of the observatory, has been intrusted to Rev. Manuel Valles, S. J., chaplain of the leper colony on Culion Island, who volunteered his services as observer. An employee of the bureau and I went thither to install the instruments and to determine the magnetic elements on the island, as magnetic observations had never before been made in this vicinity. Since the station at the government coal mines at Liguán, Albay, and the one at Quiangan, Nueva Vizcaya, still exist, there are at present 10 voluntary observers cooperating with the weather bureau. The station at Catbalogan is not counted among the voluntary stations, but is considered as official, although Doctor Cullen gives his excellent services entirely gratuitously.

The stations on Yap and Guam islands.—These stations, the establishment of which were reported last year, have proved to be of considerable service. True, none of the typhoons signaled from these places has thus far seriously affected the archipelago, but the existence of these stations has greatly increased the value of the weather bureau to the Far East. Permit me to submit some opinions of the meteorological world as to the importance of such stations.

In an article which appeared in "Nature" (London, June 1, 1905), Dr. W. J. S. Lockyer points out the great advantages to be derived for practical meteorology from stations erected on far outlying islands. The same subject is discussed in the same scientific journal (August 10, 1905) by Mr. Ernest Cooke, director of Perth Observatory, Australia. Both writers were at the time ignorant of the fact that the Philippine government had already taken steps to realize their desideratum, at least as far as the Philippine meteorological service is concerned.

In speaking of these papers, the French scientific periodical "Cosmos" (No. 1091, pp. 717-719) says: "These articles merely give a precise formulation of an idea which is in the air and already to some extent put into practice." The article then gives several instances of mainlands thus protected, and dwells especially on the completeness with which the Asiatic continent, from Cape St. James to the mouth of the Amur River, is safeguarded against surprises, thanks to the meteorological services of Japan and the Philippines.

In speaking of the typhoon of July 14-20, 1905, the author mentions a telegraphic warning issued by the Manila observatory at 3.30 p. m. of July 14: "Typhoon west of Guam; north of Yap." Later on he says: "The mention of Guam in one of the dispatches quoted above is remarkable. The American cable connecting the Marianas had hardly been laid when Manila observatory began to take steps toward establishing a station on that far-away island, whence valuable informations are derived. There is reason to hope for the establishment of another station on Yap. Nor is there any doubt that the so energetic meteorological service of Tokyo will finally find ways and means of utilizing the Japanese islands of the Bonin group—Yap, Guam, and the Bonin islands would close a circle of meteorological stations—within which the greater part of typhoons originate."

The writer of these words was unaware of the fact that on July 14 the stations at Yap and Guam were both realities, and that the dispatch which he quoted was the result of the first official communications received from both these stations.

2. INSPECTION OF STATIONS.

(a) *Stations at Dagupan and Baguio.*—The secretary of the weather bureau made use of the opportunity offered by his trip to Baguio for the purpose of buying the hill above mentioned, and inspected the stations at Dagupan (Class I) and Baguio (Class III). At Dagupan, May 14, he found everything in truly excellent shape. Less satisfaction was derived from the inspection of Baguio, May 21. The observer is sufficiently diligent in making the observations, but has no initiative. Thus, the thermometer shelter was found to be still on the ground occupied by the station before its reduction from first to third class, while the thermometers were mounted in a corner of the observer's nipa shack. There, close to the roof, the air circulates freely enough, but the arrangement is not satisfactory. The inspector ordered the shelter transferred to the new site, painted, and utilized for the housing of those instruments for which it is designed.

(b) *Tour of inspection of Mr. Jovellanos.*—The station at Butuan, Mindanao, had been for a considerable period without an observer, and the observations arriving from Tuburan, Cebu, indicated an inspection as highly necessary. Consequently I ordered the chief observer of Dagupan, who on several previous occasions had very creditably performed the task of inspector, to proceed to Butuan, mount the instruments, and instruct the young man who was to be appointed observer. He was likewise to inspect Tuburan and other stations along his route. On his way from Dagupan to Manila Mr. Jovellanos inspected the third-class station at Tarlac, May 23, and reported it to be in good condition, except a few minor improvements which he directed to be made. Proceeding from Manila directly to Butuan, he carried out his commission, for which purpose he had ample time, since he had to wait twenty-one days for a boat to take him to Cebu. On this voyage he desired to visit the station at Dapitan, but was unable to land. His report on the first-class station at Cebu is very favorable as far as conditions are concerned for which the observer is responsible. That the station is hidden away near the jail, far from the harbor, thus necessitating a telephone, for the rent of which the bureau has to pay 120 pesos per year, is not the fault of the observer.

Unfortunately Mr. Jovellanos fell sick while at Cebu and had to return to Manila for treatment without having been able to visit Tuburan.

While the inspection of Dagupan and Baguio did not entail any expense for the weather bureau, the second trip diminished the funds available for contingent expenses by about 150 pesos. This makes it painfully clear that, no matter how useful such inspections would be, they can be made but very rarely.

IV. SEPARATIONS FROM THE SERVICE.

The number of separations from the meteorological service by resignation has been unusually large during the past year. They amounted to 10, and were distributed as follows: Assistant director, 1; volunteer on the staff, 1; second-class observer, 1; third-class observers, 4; assistants to chief observers, 2; rain observer, 1. The resignations of the second-class observer and of two third-class observers had been demanded on account of continued negligence in the performance of their duties.

V. EXPENSES OF THE WEATHER BUREAU.

By act No. 1416 a total expenditure for the weather bureau of ₱90,000 was authorized, of which sum ₱22,000 might be used for contingent expenses, provided that the salary account could be maintained the necessary amount below ₱70,000. But the telegraph tolls proved to be so much heavier than had been estimated that the service would have had to be suspended unless relief had come in the form of a deficiency appropriation of ₱10,616. (Act No. 1478.) I beg to submit a summary of the expenses of the weather bureau during the fiscal year July 1, 1905, to June 30, 1906, distinguishing between disbursements actually made and expenses really incurred during said period.^a

The fact that the contingent expenses have been kept ₱5,544.66 below the appropriations for this purpose is due—besides the most strict economy—to the subsequent introduction of a code for the sending of the daily telegraphic weather note. This expedient reduces the number of words in this dispatch

^a Statement is on file in War Department.

from an average of 20 to 3 or occasionally 4 words. As the weather note is sent to 38 addresses (at 6 centavos per word) the immense saving is evident. There are, however, grave inconveniences connected with the use of this code, which will be pointed out in the next chapter.

VI. DIFFICULTIES AND PLANS.

1. DIFFICULTIES AND SUGGESTED REMEDIES.

(a) *The daily telegraphic weather note.*—The regulation in force since January 1, 1906, that the insular bureaus pay for their telegraphic correspondence has on the one hand proved a blessing to the weather bureau, inasmuch as now the daily weather reports of the stations arrive with a regularity rarely seen before; but on the other hand it is a very serious drawback as far as the daily weather notes and the storm warnings issued by the central office are concerned. As arranged at present, each of the 70 words contained in the code devised for the purpose corresponds to a complete weather note printed opposite it in English and Spanish. But weather conditions are not stereotyped as found in nature, and hence it is often found impossible to select a code word which covers the situation. The result is that the weather note as telegraphed is incomplete. To supplement the code word by additional information is out of the question, as it would only result in confusion.

A syllabic code might be suggested—that is, a code in which single syllables, each having a definite meteorological meaning, are combined into words, not necessarily found in any dictionary. But, first, this would increase the number of words from 3 (2 for address, 1 code word) to three or four times that number; secondly—and this is the chief difficulty—it would certainly lead to disastrous results. A great number of our observers are not endowed with sufficient intelligence to piece together the meaning of a message conveyed according to a code of this description and to correctly supply the connecting words and particles which would necessarily have to be omitted in the dispatch.

Therefore I respectfully suggest for your consideration whether the daily weather notes and the storm warnings—being even of greater importance for the public good than the telegraphic time signal—should not be considered as belonging to the same category as said signal and hence be transmitted free, the weather bureau continuing to pay for every other telegraph service like the rest of the insular bureaus. This would also have another very great advantage. At present only those can make out the meaning of the note who possess the code; but if it were transmitted in ordinary language, every telegraph operator could take down the notes and the warnings as they pass the wire and post them for the public benefit. Since these despatches emanate exclusively from the central office, there can be no trouble in identifying them at the central telegraph office. Besides, a special form of printed blanks might be provided, to be used exclusively for filing such dispatches, on which, in view of the resolution of the honorable Philippine Commission excepting them from telegraph tolls, an official of the weather bureau attests that they are of the nature described in said resolution.

(b) *The station at Iloilo.*—This station has again held the first rank as a source of annoyances. Its transfer was really necessary, as the grounds occupied by it were needed for the erection of a school building; but the animosity of a certain provincial official was superfluous. This gentleman threatened to cut down the anemometer if it was not removed on a certain day, and this though the chief observer was absent on leave. Happily the assistant kept the central office posted as to developments, and an appeal of the latter to the honorable executive secretary resulted in an energetic telegram to Iloilo which acted like oil on that miniature sea of trouble, at least as far as the execution of the threat was concerned.

I can but repeat the suggestion made in last year's report that the best solution would be the acquisition by the insular government of its own buildings at those places where first or second class stations are established.

2. PLANS.

(a) *The synchronization of clocks.*—In the preceding annual report attention had been called to the fact that the new mean-time clock was equipped with a double-contact arrangement, permitting the synchronizing of clocks in different parts of the city with said standard clock. This idea has met with official

approval. I suggested, however, that before the Government be put to any outlay in the matter, the experiment be first tried, at our own expense, with a few clocks belonging to the observatory. Four sets of synchronizing apparatus have consequently been ordered from the maker of the clock, Clemens Riefler, Munich, but they arrived too late to be installed during the past fiscal year. They will, however, be put to a test as soon as can be done conveniently.

(b) *New distribution of stations.*—In November, 1905, the honorable secretary of commerce and police appointed a committee of five to make suggestions looking to a general improvement of the whole interisland signal service. Among the points to be considered was the feasibility of utilizing light-houses for meteorological observations, the increase of stations at which typhoon signals are displayed, and the spreading of storm warnings. In connection with the labors of this committee, the secretary of the weather bureau, who was one of the members, worked out a plan for a new distribution of meteorological stations. The scheme provides for 5 first-class stations, 9 second-class stations, 38 third-class stations, and 5 rain stations, making a total of 57 stations. Nevertheless the salary account would be kept within the present limits, owing to reduction in the number of first and second class stations. Of the stations distributed as contemplated, 47 would be in telegraphic communication with Manila as against 34 at present, while the number of stations equipped with typhoon signals would be increased from 7 (besides Manila) to 30. Of course, the expenses for telegrams would be vastly increased; but, after all, the money thus expended reverts to the insular treasury via the bureau of posts.

Since up to the present time no action has been taken regarding the report of the above-mentioned committee, the execution of this plan has been held in abeyance.

Very respectfully,

JOSÉ ALGUÉ,
Director of Weather Bureau.

To the SECRETARY OF THE INTERIOR,
Manila, P. I.

**REPORT OF THE SECRETARY OF COMMERCE
AND POLICE.**

REPORT OF THE SECRETARY OF COMMERCE AND POLICE.

DEPARTMENT OF COMMERCE AND POLICE,
Manila, September 22, 1906.

GENTLEMEN: I have the honor to make the following report of the operations of the various bureaus of the department of commerce and police for the fiscal year ending June 30, 1906:

COMMERCE.

There is a tendency among the merchants of Manila to complain of bad times and the newspapers are filled with statements that the financial and agricultural condition of the islands is critical. It is beyond question that many of the merchants have had difficulty in making both ends meet during the year just passed and that the profits of some of the larger firms have been very small. There is no question but that there must be some hardships to existing industries with a change so radical as that which is now taking place in the Philippine Islands, viz, the opening of opportunities to the individual, the education of the poorer classes, the change in the fundamental system of government to one more democratic in theory, the improvement of the means of transportation, and the effect of bringing more modern methods of production and manufacture to these islands, the improved and cheaper system of communications, as the railroads, steamboats, telegraph and telephone, and the improved port facilities, are sure to revolutionize business and business methods in the islands. Such a fundamental change as this severs old ties and undermines old systems, to replace which it takes time and necessitates a period of growth, during which it is probable that there will be more or less hardship felt in the commercial world, the one most directly affected by these changes.

In seeking for the cause of the undoubted depression that exists one finds that credits have been much curtailed, and, while the banks have had large reserves, it has been difficult for merchants to obtain large amounts of credit. It is believed that a thorough analysis of the situation will demonstrate that this hardness of money has had more to do with this feeling of depression and the bad times of which merchants complain than an actual shortage of production. It is true that the production has been somewhat reduced, but it is also true that prices have ranged in the more important products fairly high.

The very destructive typhoon which swept the islands on September 26, 1905, very materially reduced the crops in the eight provinces of Samar, Sorsogon, Albaj, Ambos Camarines, Tayabas, Batangas, Laguna, and Cavite. The hemp destroyed has had a marked effect on

the total production of hemp in the archipelago, showing a falling off of 17,986 tons, the total amount shipped during the six months ending June 30, 1906, being 48,227 tons, as opposed to 66,213 tons shipped for the corresponding period of the previous year. This shortage of hemp has resulted in an increased price, the price going from an average of ₱346 per ton in the first six months of 1905 to an average of ₱378 per ton in the first six months of 1906.

While the storm did not destroy many coconut trees, it shook off the growing nuts and greatly damaged the year's crop, particularly in Laguna. Apart from this difficulty there has been a drought in Mindanao, Cebu, and other of the southern islands, and somewhat of a pest of locusts which did considerable damage in some of the provinces directly north of Manila.

It must always be expected that each year will bring forth something that threatens or destroys part of the crop, but in spite of these troubles the gross exports of the islands, excluding currency, amounted to ₱63,836,760, as opposed to ₱64,711,730 for the previous year. For the eight fiscal years since American occupation the figures of exports and imports are as follows:

Year.	Imports.	Exports.	Total.
1899.....	₱26,233,134	₱29,280,334	₱55,513,468
1900.....	41,202,876	39,642,694	80,845,570
1901.....	60,552,400	46,445,696	106,998,096
1902.....	64,058,714	49,089,716	113,148,430
1903.....	65,956,890	66,300,240	132,257,130
1904.....	66,442,502	60,452,254	126,894,756
1905.....	61,758,096	64,711,730	126,469,826
1906.....	51,597,710	63,836,760	115,434,470

A comparison of these figures will show a state of continuous growth from 1900 to 1903, in which year the American troops were so heavily withdrawn from the islands, and then there was a slight falling off of imports and exports of about 4 per cent in 1904 over the preceding year, and less than 1 per cent in 1905. In 1906 the falling off amounted to about 9 per cent. As conditions were so unsettled in 1898 and 1899, it is not fair to draw comparisons, but the slight decrease since the best year of American occupation is not enough to justify anybody saying the trade is paralyzed.

A further analysis of the imports reveals the fact that the imports of rice show the following totals by fiscal years:

1899.....	₱3,877,864	1903.....	₱30,122,646
1900.....	6,372,396	1904.....	23,097,628
1901.....	10,981,916	1905.....	14,913,476
1902.....	13,156,962	1906.....	8,743,964

It will be seen that of the falling off of imports in the past two years ₱14,844,792 is accounted for by the decrease in rice importation, leaving a net decrease of imports of all other commodities of ₱491,128, which can be taken as negligible. It will also be seen that the exports have decreased about 1 per cent, not a very considerable amount. It is a matter for great congratulation that the people of the islands should be raising their own food supplies.

In the United States the railroad earnings are ordinarily taken as a barometer of general prosperity. I beg to call attention to the

comparative annual reports of gross earnings of the Manila and Dagupan Railway Company. During the past two years 80 miles have been constructed in addition to the 120 miles originally built, but as the completion of these lines has been only during the last half of the present fiscal year the result of their operations does not have a marked effect on these figures, which are fairly comparative for a given mileage:

Year.	Gross earnings.	Year.	Gross earnings.
1893	P500,000	1900	P725,000
1894	550,000	1901	1,300,000
1895	600,000	1902	1,200,000
1896	600,000	1903	1,575,000
1897	725,000	1904	1,475,000
1898	775,000	1905	1,694,000
1899	175,000		

The very small extent of territory covered by railroads in the Philippine Islands vitiates the use of these figures as a barometer of general prosperity, and they merely indicate that there is a sufficient increase of production and movement of freight in the six provinces traversed by the railroad to show that those provinces at least are not stagnant.

CHANGES IN THE DEPARTMENT.

On October 26, 1905, act No. 1407 was passed reorganizing the departments and bureaus of the insular government. The changes affecting the department of commerce and police may be briefly summarized as follows:

The bureau of port works was created and took over the work and property of the office of port works created under act No. 1339. It has general supervision over all improvements of ports, harbors, and navigable rivers.

The bureau of prisons was transferred to the department of public instruction.

The bureau of coast guard and transportation became known as the bureau of navigation without a distinct change in its organization.

The telegraph division of the bureau of constabulary was transferred to the bureau of posts. This, together with (later) the creation of the postal savings bank division in the bureau of posts, has greatly increased the responsibilities of that office.

The commissary store in Manila attached to the constabulary was transferred to the new bureau of supply, formerly the office of the insular purchasing agent, and the commissary stores in the provinces have been very much lessened in number.

The bureau of public works was created to cover—

- (1) The bureau of engineering.
- (2) The supervision of district engineers under the provisions of act No. 1403, abolishing the office of provincial supervisor.
- (3) The bureau of architecture.
- (4) The custody, maintenance, and repairs of all public buildings in the city of Manila belonging to the insular government.

CONSULTING ARCHITECT.

This office was established by resolution of the Commission dated September 20, 1905. The position was filled by the appointment of Mr. W. E. Parsons, of New York, selected for this purpose by Mr. D. H. Burnham, of Chicago, and the duties are defined by act No. 1495, passed May 26, 1906.

SUPERVISING RAILWAY EXPERT.

The office of supervising railway expert was filled by Mr. F. A. Molitor, selected by the Secretary of War, of the date of December 9, 1905, the appointment being made by Governor-General Wright in Washington. The duties and responsibilities of the position are defined in act No. 1507 of the Commission, the office being placed in the department of commerce and police.

BUREAU OF CONSTABULARY.

ORGANIZATION.

Under the terms of the reorganization act the name of the bureau of Philippines constabulary was changed to the bureau of constabulary for the sake of brevity. The chief and assistant chiefs became known as the director and assistant directors, respectively, to conform with other bureaus charged with civil duties. The telegraph division was transferred to the bureau of posts, the transfer taking place on the 1st of January, and the commissary division was transferred to the bureau of supply.

COST.

The total cost of the constabulary for the year was ₱3,744,000, as opposed to ₱4,123,000 for the year 1905, a decrease of ₱389,000. One hundred thousand pesos of this decrease, however, is due to the transfer of the telegraph division to the bureau of posts. Subtracting all expenditures, except those properly charged for the maintenance of order, the cost was ₱3,711,000 for the year 1905 as opposed to ₱3,644,000 for the year 1906. The full effects, however, of the reduction and reform accomplished will demonstrate themselves during the year 1907, for which the appropriation was ₱3,060,000.

FORCE.

The force at the beginning of the fiscal year was 6,967 enlisted men and 327 officers. At the end of the year there were 4,932 men and 315 officers, a decrease of 2,035 men and 12 officers.

BETTER FEELING TOWARD THE CONSTABULARY.

During the year the director of constabulary has constantly emphasized the peace nature of the organization and measures have been taken toward bringing the officers and men to a realizing sense of these.

Throughout the year the feeling between the constabulary and the natives has steadily improved, and from many parts unsolicited testimonials have come telling of the agreeable relations between the constabulary and native officials, both provincial and municipal. The undersigned never loses an opportunity to make inquiries of prominent Filipinos in the provinces in regard to the constabulary and the merit and performance of its officers, and he has reason to believe that these relations are generally cordial and satisfactory.

The assistant directors and inspectors of constabulary are now continually traveling from province to province to instruct and correct the officers and men and to detect and correct abuses. All this is having an excellent effect and many constabulary officers are now being sought after for other important positions; one is governor of one of the Moro districts, three are lieutenant-governors, and one has just been put in charge of the Iwahig penal colony.

SCOUTS.

The general improvement in peace conditions has made it practicable, notwithstanding the considerable reduction in the strength of the constabulary and the municipal police, to return to the military authorities all of the companies of native scouts that were on duty with the civil government a year ago. Thirty-one companies of 100 men each that were assisting the constabulary in the provinces near Manila, and two companies that were similarly employed in Cebu, have all been relieved from duty with the civil government. This has enabled the military authorities to concentrate the scouts into battalions by which their drill and discipline have no doubt been improved, and also considerable economy in transportation of supplies and in rents effected. The battalions have been located, as far as possible, where their presence would have good moral effect and where, should occasion arise, companies could be quickly detached for use with the constabulary. Twice recently, in Bataan and in Pangasinan, a company has been called for in an emergency and prompt and efficient service was rendered. The companies were returned to the military authorities as soon as the emergency had passed. A number of scout companies are on duty with the troops in Leyte and Samar, where they are doing excellent work.

FIRST DISTRICT.

By the tactful and masterful management of Colonel Bandholtz, acting director of constabulary, the provinces in the neighborhood of Manila have been finally cleared of ladrones.

At the time of the last annual report there were in the provinces of Batangas and Cavite a remnant of the bands of ladrones that had infested that region for so many years. These were reduced to such an extent that on the 19th of October the writ of habeas corpus was restored to these provinces, they having returned to an almost normal condition. The only noticeable activity displayed during the year was another raid on the town of Taal.

A certain individual in the city of Manila, known as Dominador Gomez, who has been convicted of estafa and was out on bail awaiting a decision by the supreme court before serving his sentence in

Bilibid, offered to bring in these and other bandit chiefs who had infested the provinces of Bulacan, Rizal, Cavite, and Batangas. This he proceeded to do, and twelve of these outlaws surrendered unconditionally, all of them having signed a paper to the effect that they came in of their own free will, and that no promises of immunity from punishment for their crimes had been given them by the government. They are now held by the constabulary awaiting trial. This finally ended the ladrone situation in the provinces close to Manila, which had been the storm center of ladronism during and since the days of the Spaniards. The relief to the poor people of these provinces is unbounded, and there will be a very marked increase in production of all kinds; and, indeed, reports indicate that a very much larger acreage is being planted in these provinces than before. General Aguinaldo himself has leased from the bureau of lands 500 hectares of one of the "Friar estates," in a district close to the mountains hitherto infested by the outlaws, an evidence that he believes there will be little more trouble from this source. During the past two years the products of his hacienda, or farm, which he had near the town of Imus, have been very much decreased owing to the difficulty of getting labor, partly due to the fear of the ladrones and partly to the reconcentration which it had been necessary to enforce in some of the towns both in Cavite and Batangas.

An outlaw known as Salvador, who has selected a religious fanaticism as the guise under which to work his depredations, has been in hiding for months in the swamps of Bulacan and Nueva Ecija and the forests in the neighborhood of Mount Arayat. During the spring of 1906 he became active and began to work up a revival of the fanatical Santa Yglesia (or Holy Church) organization. The followers of this movement were wholly drawn from the most ignorant and superstitious people. They are devout in their observances, but the details of their rites will not bear too close a scrutiny. It is reported that their chief drew from the weather bureau in Manila such forecasts of the weather as to enable him to gain great credence among his people for prophetic powers, he having foretold them of times of storm and flood. He used this as an ingenious means of levying contributions from the ignorant natives, threatening them with devastation by the elements if they did not pay. This movement gained large numbers of supporters in the provinces of Bulacan, Nueva Ecija, Pampanga, Tarlac, and Pangasinan, and caused the constabulary to be especially alert in these provinces.

On April 16 the fanatics rushed the constabulary barracks in the town of Malolos, province of Bulacan, killing the sentinel and capturing fourteen guns. Most of these guns have been recaptured since that time.

During the month of April the ladrones made an attempt to raid several constabulary cuartels on the same day, evidently in the hope of gaining prestige by a number of successes. The movement was met by a repulse in each instance except at Malolos, and soon afterwards General Wood, commanding the Philippines Division, as usual heartily cooperating with the insular authorities, ordered practice marches of two regiments of infantry and three squadrons of cavalry through the provinces affected by this movement. Troops from Stotsenberg and Fort McKinley started simultaneously and very effectually covered the ground. It was not expected that they would

see any outlaws or encounter resistance of any sort, nor did they, but it had the moral effect of letting the people know that the troops were at hand and would give protection if it were needed. Shortly after this the constabulary struck this band several times, inflicting heavy blows and killing two of the principal leaders.

SECOND DISTRICT.

Throughout the second district uniform peace, good order, and general good feeling prevailed. This district has been fortunate in its assistant chiefs of the constabulary and many expressions of esteem from native officials have come to headquarters of the three officers who have successively occupied this position, namely, Colonels Bandholtz and Harbord and Major Borseth.

Through active and efficient work by Governor Queson of the province of Tayabas and people of the municipality of Kasiguran, aided by the constabulary, one small band was surprised and destroyed near that town. Other than this nothing more serious than some slight depredations by robbers on one or two of the mountain roads in Tayabas has been reported.

THIRD DISTRICT.

In this district, which includes the island of Samar, conditions have always been unsatisfactory but have been gradually getting better until now little is heard of the movements of the pulahanes. The east coast of Samar has remained under military rule, and recently, in April, a plan was prepared between General Wood, the governor-general, and the provincial governor by which the constabulary were withdrawn to the coast towns and the interior regions lying about the towns of San Jose and Calbiga, to take charge of the normal police duties, and the military authorities have charge of operations in the interior excepting the regions named.

In March, 1906, a serious disaster occurred. Governor Curry had arranged for the surrender of all of the pulahan leaders, and they were gathered in a mass. Some ill-advised people from the coast towns came up to see the surrender, and by some means or other the pulahanes got suspicious, and in place of surrendering, at a given signal opened fire upon the constabulary and rushed them. The constabulary at the time were armed with single-firing carbines, useless to them after one shot, and they were soon confronted in an unequal hand-to-hand battle against superior numbers. The constabulary officers behaved splendidly and, although wounded, rallied their forces and drove off the pulahanes, causing them a loss of 43 dead as against a loss of 22 constabulary men killed and 11 wounded, among those wounded being two officers. The work of Captain Jones in this action is deserving of the highest praise. Immediately after this engagement arrangements were made to secure 500 Krag rifles from the military authorities in order to arm the constabulary in this district with repeating arms. This was done, and it is now recommended that all of the constabulary be immediately armed with Krag rifles, as it will eliminate disasters such as have taken place several times in Samar and Leyte.

Until the 19th of June, 1906, Leyte remained in the peaceful condition it had been in throughout the year. The people had elected a Filipino by the name of Jaime de Veyra in place of the constabulary officer, Major Borseth, who had done such good service for them as governor for two terms. But the new governor has not had the situation so strongly in hand, and on the above-noted date a new outbreak of pulahanes occurred, in which they rushed the municipal police of Burauen, killing 5 natives and securing 14 rifles. With this number of guns a dangerous situation sprang into existence, and active operations were at once taken against them. The movement had gained such headway that the pulahanes, numbering about 200, succeeded in ambushing 34 constabulary men, who were accompanied by three Americans, of whom Lieutenant Worswick, a recently appointed officer of the constabulary, and an American scout named McBride, were killed. Upon receipt of this information the assistance of the military was immediately requested, and General Wood, commanding the Philippine Division of the Army, immediately ordered General Lee, commanding the Department of the Visayas, to send five battalions to take the field and restore order. There has been one serious engagement in which the pulahanes, numbering nearly 500, charged the troops—in this case composed of regulars and constabulary—several times, but were beaten off, leaving 49 dead on the field. The very prompt and hearty assistance and cooperation of Generals Wood and Lee in this juncture are very cordially appreciated, and it is believed their action saved many lives and much property and prevented a much more dangerous movement than has developed.

Throughout the rest of the Visayan Islands uniform peace has prevailed. By the energetic action of Governor Osmeña, the newly elected governor of Cebu, the surrender of all the remaining outlaws in the northern part of the province, with the only four guns which they had, was effected.

FOURTH DISTRICT.

In the fourth district there have been occasional disturbances among the Igorots who have always been accustomed to make war on one another and have to be constantly watched to see that they settle their differences by reference to higher authority. Occasionally unscrupulous agitators in one province or another endeavor to get up disturbances among the ignorant people and such an occurrence took place recently in one of the Ilocano provinces, but information was readily brought to the authorities by peace-loving citizens and the matter assumed no importance. With these exceptions the whole island of Luzon, comprising the first, second, and fourth districts of constabulary, remains in a condition of general tranquillity and the conditions have steadily improved throughout the year.

FIFTH DISTRICT.

In the fifth district, which is composed of Surigao, Misamis, and the Moro provinces, there has been uniform progress from the beginning to the end of the year. In October, 1905, Captain McCoy, aid

to General Wood, effected a masterly maneuver and captured and killed Datto Ali, the most dangerous outlaw in the island of Mindanao. This improves the situation there, and the problem now is one of maintenance rather than establishment of order, although peaceful habits and pursuits must be taught the Moros.

A few outlaws in Jolo, entrenched in the crater of the extinct volcano of Mount Dajo, on that island, began depredations upon the peaceful people of the island. After the exercise of much patience and conciliatory efforts by Colonel Scott, governor of Jolo, Federal troops, assisted by the Navy and the constabulary, assaulted the stronghold and exterminated the band. In this engagement the constabulary led the advance with distinguished gallantry, Capt. John R. White being in the lead and being wounded dangerously in the leg in the course of the assault. The constabulary had 3 killed and 15 wounded. This action was absolutely necessary to the welfare of the people of Jolo. The position was first shelled by a naval gunboat and then assaulted by the troops and constabulary. The Moro women fought alongside the men and held their children before them, having sworn to die rather than yield. In this way a number of women and children were among the killed, an unfortunate but necessary evil.

CARABAO STEALING.

Throughout the archipelago there is a very general habit of carabao stealing, which is somewhat accentuated at the present time by the high price of carabao and the great scarcity of that animal in many of the provinces, owing to the rinderpest. It is a most difficult practice to break up, and instances have occurred where minor local officials have been guilty of connivance.

CONSTABULARY SCHOOL.

As a result of the act passed September 11, 1905, increasing the pay of the constabulary officers, and by reason of the gradual weeding out of the men not adapted to the service a fine quality of young officers has been attracted to the service, and they are now put through a preliminary training school before they are allowed to take the field. The course consists of instruction, for six months, by means of recitations and lectures, in the duties of peace officers, the laws with reference to crime and disturbance of the peace, the rules of evidence, and other procedure in the lower courts, besides practical drill and instruction with the constabulary companies on duty at the school. The new officer is required to study Spanish, and to begin work in one of the native dialects. This work should be of the utmost value to the officers and will greatly improve the service.

PROVISIONAL DISTRICT.

The provisional district, which included the provinces of Cavite, Laguna, and Batangas, and part of Rizal, has been returned to the first district, owing to the reestablishment of good order in those provinces, which makes it unnecessary to maintain a separate organization for them.

CONSTABULARY BAND.

The constabulary band has been maintained throughout the year and has given very satisfactory results. Captain Loving, the director, has succeeded in making an admirable band of eighty pieces, which it is believed will compare favorably with any of the bands in the Orient. As now composed it is one of the most attractive features for visitors to Manila, concerts being given three times a week on the Luneta, and every evening that the band plays a great number of people come out to hear the music.

MUNICIPAL POLICE.

The director of constabulary reports a total of 5,357 municipal police, which is a steady decrease, and is now about 60 per cent of those reported in 1903. Of these, 2,234 are under the direction of the senior inspector of constabulary in the provinces, fifteen provinces having availed themselves of the opportunity offered them for this supervision by authority of act 781.

ABSENCE OF THE CHIEF.

On September 6, 1905, Brig. Gen. Henry T. Allen, chief of the constabulary, went home for a leave long due and did not return until June, 1906, he having been in Washington for consultation in regard to sundry important matters. During his absence Col. D. J. Baker, jr., was named by the governor-general to serve as acting director of constabulary, which he did in spite of severe physical infirmities with which he had been afflicted in the arduous duties which had been assigned to him as chief of the fifth provisional district in charge of operations in Cavite and Batangas. Colonel Baker took the onus of the sharp reduction of constabulary which was ordered, and reduced the force from in the neighborhood of 6,500 to less than 5,000 in the six months in which he held the position of acting director. The arduous nature of this work told on him most severely, and he was finally prevailed upon to take his leave of absence, having risked his life by his devotion to duty. Upon his retirement, on the 27th of March, 1906, Col. H. H. Bandholtz was made acting director of constabulary, and held that position with marked success until the return of General Allen.

For further information and details, attention is called to the report of the director of constabulary, hereto attached, marked "Exhibit A."

RAILROADS.

On June 12, 1905, proposals were advertised in Washington and Manila for bids for the construction of railways for eleven routes, aggregating 1,113 miles of lines in the islands of Luzon, Panay, Negros, Cebu, Leyte, and Samar, as stated in the last annual report of the department.

On December 20, 1905, bids were opened in Washington. There were three in number: One for all of the lines called for in the island of Luzon, one for the lines in the provinces of Albay and Ambos

Camarines in Luzon, and one but for three of the Visayan Islands, viz, Panay, Negros, and Cebu. As none of these bids complied strictly with the terms of the proposals it was thought necessary to reject them all and advertise again, the new advertisements being modified to meet the reasonable requests of one of the bidders, known as the Visayan Syndicate, and some of those of Messrs. Speyer & Co., who bid for the island of Luzon.

On the 20th of January, 1906, the bids were reopened, there being this time but two bidders, Messrs. Speyer & Co. for Luzon and the Visayan Syndicate for Negros, Panay, and Cebu, the latter being composed of Messrs. William Salomon & Co., bankers, of New York; Cornelius Vanderbilt and J. G. White & Co., of New York; Charles M. Swift, of Detroit, with whom are associated the International Banking Corporation; H. R. Wilson, and Heidelberg, Eickelheimer & Co., of New York. As these parties had bid entirely within the terms of the proposal the concession was forthwith awarded to them. Their bid calls for the full amount of guaranty authorized by act of Congress, known as the Cooper bill, approved February 5, 1905. The form of concession was agreed upon between the representative of the syndicate and the Secretary of War, in Washington, cabled to Manila for comment, and act No. 1497 was finally passed on May 28, 1906, authorizing the governor-general to execute the concession, which was done as of date of July 10, 1906. The Visayan Syndicate transferred their award to a new company by the name of the Philippine Railway Company, organized under the laws of the State of Connecticut. These contracts were mailed to Washington for final execution and approval.^a

The salient points of the concession for the Visayan Islands was as follows:

- (1) An agreement to build 295 miles of railroads in the islands of Panay, Negros, and Cebu.
- (2) The government guarantees interest of 4 per cent on the first mortgage bonds issued under restrictions particularly set forth in the act of Congress.
- (3) The guaranty lasts for a period of thirty years.
- (4) The concession is perpetual.
- (5) Taxation of one-half of 1 per cent of the gross earnings for thirty years and $1\frac{1}{2}$ per cent for the ensuing fifty years.
- (6) The company is given six months to complete its surveys and twelve months in which to complete the first 100 miles after the surveys have been approved; 100 miles to be completed each year thereafter.
- (7) Right of entry of material free of duty.
- (8) Privilege of using right of way, 100 feet wide, of the public domain, excepting always such part as is laid aside for public uses, etc.
- (9) Gauge to be 3 feet 6 inches and quality of construction to be up to first-grade modern standards.

^a Since writing the above these concessions have been executed by the railway company, and written request has been served by the governor-general notifying the contracting company that surveys must be forthwith begun.

ROUTES.

On the island of Panay, running from Iloilo to Capiz and Batan, on the north, 95 miles.

On the island of Negros, from Escalante, a line parallel to the north and east coast, to San Juan de Ilog, approximately 108 miles.

On the island of Cebu, from Danao, along the coast to Argao, 60 miles, with the right to build across the island to the west coast an additional distance of 20 miles.

No bids were received for Leyte and Samar.

The Speyers presented two bids—one for a line from Dagupan to Laoag, a distance of 168 miles, for which the full amount of guaranty was asked for a period of thirty years; the second for certain other lines in the island of Luzon, aggregating 390 miles. These may be roughly described as a line from Manila south through the provinces of Batangas and Tayabas; a line in the southern peninsula dividing the province of Albay; a number of branch lines from these railroads and from the Manila and Dagupan, now existing, the control of which had been secured by the Speyers previous to bidding.

The bid for the guaranteed line to the north was made conditional upon the government accepting the proposal for the unguaranteed lines. The proposition made by the Speyers contained several objectionable features that the government did not feel justified in granting. These are, briefly, as follows:

(1) Of the 390 miles, 126 were called branches and were so worded as to be only an option of the company to build without in any way binding them to do so.

(2) No definite time was given for the completion of the surveys or construction of the railroad.

(3) Taxation to be continued permanently at the low rate of $1\frac{1}{2}$ per cent of the gross earnings.

(4) Rates for government officials and freight to be established permanently at the present high figures.

(5) The power of the government to grant franchises to competing lines was limited.

After several months of negotiations these points were satisfactorily adjusted and the terms of the concession agreed upon, which were later executed and which can be briefly summarized as follows:

(1) Company to build 428 miles, more or less, of railroad throughout the island of Luzon.

(2) No guaranty is asked on any of this construction.

(3) While the initial rates are to be based on those now enjoyed by the Manila and Dagupan Railway, the government has the power to regulate them at any time.

(4) The existing Manila and Dagupan Railway and all its branches give up their franchises, withdraw any claims which they may have against the municipal, provincial, or insular governments or the Government of the United States, and come in under the new charter on exactly the same basis at which the new lines go in.

(5) The concession is a perpetual one.

(6) There is nothing said in regard to competing lines, the government being free to grant franchises for such lines at any time.

(7) Taxation is one-half of 1 per cent of the gross earnings for

thirty years, 1½ per cent for the ensuing fifty years, and thereafter to be fixed by the government.

(8) The company is given twelve months to complete its surveys and thereafter two years in which to complete the first 150 miles and agree to complete 75 miles each year thereafter. This does not compel particularly rapid action.

(9) Right of entry of the material for the construction free of duty.

(10) Privileges of using right of way, 100 feet wide, of the public domain, excepting always such part as is laid aside for public uses like parks, streets, etc., and such improved land as the so-called friars' lands, etc., for which payment must be made.

It will thus be seen that while the company has abandoned its proposition to build 168 miles of guaranteed lines it is now contracting to construct 38 miles more of unguaranteed lines than proposed in the bid opened January 20. Of this 38 miles, 35 is for a line from Dagupan to San Fernando de la Union, which begins the construction of what will eventually be a line reaching Laoag and thus serve the populous Ilocano districts.

Upon the completion of these negotiations act No. 1510 was passed, on July 7, 1906, authorizing the governor-general to sign the concession in accordance with the terms agreed upon and outlined above, which was forthwith done.

The Manila Railroad Company, organized under the laws of the State of New Jersey, received the award from Speyer & Co., and have designated Mr. Horace L. Higgins, manager of the Manila and Dagupan Railway, as their representative upon whom process could be served in the Philippine Islands.^a

It will thus be seen that the final steps have been taken and the machinery set in motion which will result in the construction of some 700 miles of railroad—430 miles in the island of Luzon and 295 miles in the Visayan Islands.

BUREAU OF PUBLIC WORKS.

By the passage of the reorganization act the new bureau of public works was created, comprising the following functions previously performed by other offices and bureaus:

1. The bureau of engineering;
2. The bureau of architecture;
3. Improvements of Benguet Province, including the management of the Benguet road; and
4. Custodian of public buildings belonging to the insular government in the city of Manila.

The salary of the director of public works was increased to \$6,000, and the office of the consulting engineer to the Commission was abolished.

The consulting architect and the supervising railway expert report directly to the secretary of commerce and police, and receive their

^a Since writing the above these concessions have been executed by the railway company, and written request has been served by the governor-general notifying the contracting company that surveys must be forthwith begun.

clerical force and machinery for handling the paper work for their force from the bureau of public works very much as the courts had previously done from the bureau of justice.

FINANCIAL STATEMENT.

During the fiscal year the expenditures for salaries and wages amounted to ₱193,000; for contingent expenses, ₱42,000; for public works, ₱177,000; for maintenance of public buildings, ₱102,000; a total of ₱515,000. It will be seen that very little public work was undertaken during the fiscal year just passed. This was due to the necessity for economy. On June 30, 1906, there were 33 technical and 50 nontechnical Americans in the force, and 60 Filipinos; a total of 143.

ROAD LAW.

On July 13, 1906, the Commission passed an act known as the road law, which provides that, wherever accepted by the provincial board and the majority of the assembly of the presidents and councilors of municipalities of any province, five days' work upon the highways of every able-bodied man in the province should be rendered every year or payment of an equivalent of five days' wage in cash. It is hoped these assemblies will see their way to accept this law.

As soon as the road law is in operation it is hoped to establish throughout the archipelago a caminero system, as it is called, each road being divided into sections of such length as can be cared for by the continuous work of one man, who will be provided with the necessary implements, including a rain coat, wheelbarrow, rock hammer, rake, shovel, pick, etc. Those wishing to work out their tax can deposit road material at given depositories along the line of the road, or give their service to new construction or reconstruction where the nature of the work is such that gangs are necessary. The money received from those not wishing to work will help support the caminero or road worker. In this way the definite responsibility for the deterioration of any section of road will be readily placed. The ditches and culverts will be kept clear, and someone responsible will be on hand to see that they are not obstructed in any way or used for irrigating purposes, a practice which has tended to destroy many miles of good road.

USE OF WIDE-TIRED CART WHEELS.

The experiment of making wide-tired wheels in Bilibid has not met with a steady response from the provinces, although 690 pairs have been sold. The prison now has 360 pairs of wheels on hand, and there does not seem to be much demand for them. It is hoped that the provincial authorities will awaken to the importance of this reform and urge upon the municipalities the further use of these wheels.

PERMANENT CONSTRUCTION.

The policy has been enunciated, and it is hoped will be steadily adhered to in the future, of constructing everything of permanent and durable materials and of creditable designs. Many of the bridges put

in by the Americans have been built with unseasoned or cheap timber and not the best native hard woods, and are already falling into decay, many roads having become impassable owing to the failure of bridges to stand. An additional original expense of 50 per cent will produce a structure that will last four times as long and perhaps much more.

Pursuant to this plan the director of public works has been instructed by the department to make all of his future estimates and to prepare all of his future plans for bridges and culverts to be made of permanent material, and also, wherever his finances will justify, in his plans for public buildings to specify either concrete, stone, or a superior grade of native hard wood properly seasoned, thus serving the double purpose of making an economical and permanent structure of creditable design and fostering native industry. The experience of concrete reenforced with steel has demonstrated that this is the proper style of construction for these islands and more and more construction of this kind is being done.

ROAD CONSTRUCTION.

On March 31 the Capas-O'Donnell-Iba road was completed at a cost of ₱350,000. This road was begun on June 1, 1904.

The Cebú-Toledo road has been approximately 45 per cent completed, ₱126,000 out of the ₱178,000 appropriated having been spent.

The Wright-Taft road, crossing the island of Samar, has been completed for 18 miles, or 50 per cent of the total, at an expenditure of ₱95,000.

The Calamba-Los Baños-Bay road is completed for 11 miles, or 90 per cent of the total construction.

The Magdalena-Santa Cruz road, in the province of Laguna, is completed for 4½ miles.

The Tobacco-Ligao-Guinobatan-Jovellar road, up to within 5 miles of Jovellar, was completed in September, 1905, the work having been done by means of prison labor.

The Pagbilao-Atimonan road, having been constructed of temporary materials in a mountainous country, needed an additional appropriation for rebuilding, which has been done in part.

IRRIGATION.

The direction of the bureau has been gradually turned toward irrigating works. The director of public works has for years requested the employment of an irrigation engineer, and a perusal of his report for this year shows many requests for examination of irrigating projects.

WELL BORING.

During the year the well-boring outfit has been in continual demand. Five wells were driven during the past year, three of these in Cebú occupied nine and one-half months, and 19 requests are on file for additional ones. The importance of supplying an untainted supply of fresh water has commended itself so strongly to the Commission that they have authorized a second well-boring outfit to be purchased, and as soon as it can be put in operation the government will

keep two of these outfits in continuous operation supplying the demands of the municipalities, provinces, and bureaus requesting it. A charge will only be made for this work when water is discovered.

DISTRICT ENGINEERS.

The district engineer system referred to in my last annual report has been in operation half a year, and while the relation of the district engineer to the municipalities is only advisory the director of public works reports that in the last six months of the year, out of ₱420,000 expended in the provinces upon public works, ₱368,000 was expended under district engineers.

DIVISION OF BUILDING CONSTRUCTION AND REPAIR.

The bureau of architecture was abolished by the reorganization act and the force transferred to the bureau of public works, which now maintains a division of building construction and repair. The general policy has been adopted of letting contracts, so far as possible, for the construction of buildings, and the extensive shops, lumber yards, etc., connected with the bureau gradually discontinued. The fact that the insular government has hitherto seen fit to place orders for millions of feet of Oregon pine and do its construction with that kind of wood when superior woods are to be had in the Philippine Islands is contributory cause to the languishing condition of the lumber industry, to which attention is called in the report of the director of public works. It is undoubtedly true that the new policy of using native woods in every instance will do a great deal to encourage the merchants to buy, prepare, and season lumbers and carry them in sufficiently large quantities to make their use more available not only for the Government but for such part of the general public as want to patronize the local industry.

BENGUET IMPROVEMENTS.

As reported in the last annual report the almost unprecedented downfall of 17 inches of rain in twenty-four hours on June 20, 1905, did great damage to the Benguet road. There was but a small force put on this work to reopen it, with the result that the road was not finally opened to travel until December of that year. This storm, however, has cleaned away much of the overhanging and loose material, the fall of which was impending, and when the unseasonable typhoon of May 18, 1906, swept over Luzon, followed by a second one at an interval of but a few days, a total rainfall of 16 inches in twenty-four hours, of 22 inches in five days, and of 54 inches for the month of May was recorded in Baguio. This time the work of the constructors stood the test much better and the road was closed only four days. The slides brought down at this time were readily shoveled away by gangs principally made up of Igorrote workmen, and the road was left with very little damage that could be seen except to the roadbed, which in places was badly rutted. The following rainy season, marked by continuous downpours of heavy rain, during which regular traffic has passed over the road, resulted in the development of many mudholes in the last 2 miles, which will

have to be remedied by metal and rock construction in the coming dry season, and appropriation and arrangements have been made to accomplish this result.

A concession has been granted to the Manila Railroad Company which has contracted to build a line to Camp One, and it is hoped that it will do so in the present fiscal year and thus put Baguio within easy reach of everyone.

During the year the township of Baguio has been surveyed, residence and business lots have been staked off, and all those advertised for sale have found ready purchasers. A site was laid out for the governor-general's residence, an appropriation has been made, and plans have been drawn for a suitable residence to be erected during the coming year. Sites for churches, schools, residence of the archbishop of Manila, Jesuit observatory, and country club have been marked out and sold to different organizations, and early construction on many of them is promised. Sites for the constabulary barracks and school, the hospital, and cottages for employees have been laid aside and construction on these is also in contemplation.

For further information and details attention is called to the report of the director of public works, hereto attached, marked "Exhibit B."

CONSULTING ARCHITECT.

By resolution of the Commission dated September 20, 1905, the department was authorized to create the position of consulting architect at a salary of \$6,000 a year. The necessity for this action was becoming very evident. The needs of the insular, provincial, and municipal governments have demanded the presence of at least one competent and experienced architect, trained in what best modern practice has come to regard as good style. With this resolution the Commission was able to secure the services of Mr. W. E. Parsons, of New York, selected for this purpose by Mr. Burnham.

On May 26, 1906, act No. 1495 was passed, defining the position and duties of the consulting architect and giving him a definite place in the organization—the duty of designing all insular public buildings, with direct and general supervision over the proper treatment of the monuments and structures of the city of Manila and a voice in the plans for additional development. His services are also available for provinces and municipalities throughout the islands.

Since American occupation no advance had been made in the direction of making beautiful, permanent, and harmonious groups of buildings or arrangement of cities until the arrival of Mr. Burnham. With his departure the interpretation of his plans was delegated to competent and well-trained engineers, but men wholly without architectural or artistic training. The result has been a tendency to ignore some of the more important features of Mr. Burnham's plans in Manila and Baguio and some buildings, particularly those for school purposes, have been constructed of undesirable design. The necessity for a beautiful city at Manila as an attraction to tourists and for the greater merit of pleasure and education of both natives and Americans, is such that the presence of such an official is a very necessary adjunct to the insular force. A number of new buildings of great importance are now in contemplation, notably the hotel

adjoining the Luneta, the new hospitals, the new warehouses for insular use and for the interisland commerce, all to be placed on important and dignified public sites, and the possibility of a capitol building being needed in the near future has been such as to give plenty of work for the consulting architect to do.

In the last three months of the fiscal year the consulting architect has designed 15 buildings or additions to buildings, including 7 schools and 2 constabulary quarters, and among others 2 provincial buildings. He has prepared preliminary plans for 12 additional structures now under consideration. He has laid out the plan for the development of Zamboanga, Baguio, and Tarlac, and his services have been required for making plans for an orderly group of buildings in several capitals, the people of the provinces taking very readily to the idea of getting a well thought-out design toward which to work.

For further details attention is called to the report of the consulting architect, hereto attached, marked "Exhibit C."

BUREAU OF POSTS.

Under the terms of the reorganization act the telegraph division of the bureau of constabulary was transferred to the bureau of posts, thus giving that bureau control of all of the methods of transmitting communications controlled by the insular government. This is in accord with the practice of some of the most progressive nations, notably, England, France, Japan, etc., and seems a logical arrangement.

The total cost of operating the bureau for the fiscal year was ₱838,038, of which ₱100,706.04 was the cost of the telegraph division for the six months during which it was in the bureau, while the receipts of the whole bureau were ₱486,758.36, making a net loss of ₱351,279.64 for the year. By the reorganization act all franking was done away with and the insular government now does no free service except business of the United States Government, which includes business done by the military authorities. It is too early to show the result of this change, but it is believed it will tend to reduce an unnecessary amount of paper work and that it will demonstrate that the bureau is much more nearly self-supporting than it has been ranked in the past.

During the year the personnel has increased from 610 at the beginning to 1,003 at the end, an increase of 393. Of this increase, 67 have been Americans and 326 Filipinos; thus increasing the proportion of the Filipinos in the service from 74 per cent at the beginning of the year to 78 per cent at the end.

During the year the business of the post-offices showed a steady gain, the number of post-offices having increased from 414 at the beginning of the fiscal year to 476 at the close, an increase of 62 post-offices. There are now 626 municipalities in the archipelago. The appropriation bill for the ensuing year provides for 75 additional post-offices, bringing the total authorized number up to 551, which is 88 per cent of the total number of municipalities. It will thus be seen that at this time we are approximating a complete postal service for the municipalities.

During the fiscal year the bureau handled 245,831 pieces of registered mail, as against 219,767 pieces during the previous year, showing an increase of 12 per cent. The director of posts calls attention to the fact that the last six months of the year, when the different bureaus using the government service had to pay, as compared with the first half of the year, when registration was done free, shows a decrease of 75 per cent in the number of pieces of official mail registered, and that two-thirds of those which were registered originated in the court of land registration in the form of documents, which by law must be registered.

The number of money-order offices was decreased from 62 to 60 during the year; the number of orders issued was 94,261, an increase of 11.6 per cent; the amount of the orders issued was \$3,687,126.81, an increase of 7 per cent, the average amount of each order issued being \$39.10, as opposed to \$45.80 during the last fiscal year.

On May 15, 1906, act No. 1476 was passed by the Commission, increasing the fees on money-orders over \$10 payable outside the islands. This law also provides that no postmaster may issue more than ten money orders to the same person and payable to the same person or firm on any one day. The increase in fees, as well as the limit on the number of money orders that might be purchased, was made for the purpose of preventing the use of the money-order system for the shipment of large amounts of money to the United States which would properly be made by means of gold-standard exchange drafts sold by the treasury bureau, the rate of exchange for which is \$7.50 per thousand.

The mails were carried 605,514 miles during the fiscal year, at an average cost, per mile traveled, of 9.6 centavos, a decrease of 2.7 centavos per mile, or nearly 22 per cent less than the cost per mile in 1905, which had been 30 per cent less than the year 1904. This shows a steady advance in economical administration.

The receipts from the sale of postage to the public during the year increased from ₱273,000 to ₱320,000, an increase of 17 per cent. This can be compared with the increase of 13 per cent in the number of post-offices. Counting the receipts from all sources, including telegraph service and postage stamps sold to the government, the earnings of the bureau were ₱486,000. Considering that the franking privilege both for mails and telegrams was extended to the insular government service for the first part of the fiscal year, it is reasonable to expect a great increase in the earnings of the bureau for the fiscal year 1907. While much of these apparent earnings will come from the coffers of the insular and provincial governments, yet the results will show the real service performed by the bureau.

During the year the new issue of Philippine Islands postage stamps was completed and has been shipped to Manila. They will be put on sale about the time of the present writing.

The Manila post-office during the fiscal year made 16,227 dispatches of mails, aggregating 41,351 sacks; receipts of mails, 12,919, aggregating 18,992 sacks.

TELEGRAPH DIVISION.

With the transfer of the telegraph division to the bureau of posts arose the vexed question of the transfer to the civil government by the military of the telegraph and telephone lines and cables operated

by them. The business of running a telegraph service in the Philippine Islands is not commercially profitable. It was originally necessary as a military measure, and, with the reduction of troops in the islands and the return of peaceful conditions throughout the provinces, the military authorities very naturally wished to rid themselves of this expense and return it to the civil authorities, as it had become in most places a purely civil function. The insular government has gone slow in accepting this responsibility, as its funds are not adequate to meet the demands made upon it. The Chief Signal Officer of the Army presented the proposition to transfer to the civil government all of the lines, excepting the main line from Manila to Zamboanga, the cables, and the branches connecting military posts, upon condition of receipt by the military of permanent free service over the insular lines and a condition that all commercial business over all their lines should be filed by insular officials, all receipts going into the insular treasury. It was difficult to estimate the exact result of this in dollars and cents; but its practical operation was not feasible, as it provided for a dual control and an unsatisfactory and clumsy way of handling all commercial business. The Commission, after consultation with General Wood, presented a counter proposition agreed to by him for the insular government to take over all of the military lines and cables, useful for insular and commercial purposes, the military authorities to receive free service for two years, which is equal to the period for which the insular government has had free use of the military line since the last adjustment. Upon receipt of further telegrams from the Secretary of War for additional consideration the Commission disagreed as to the recommendations, and the matter was allowed to stay in the unsatisfactory condition in which it has been in the past. It is hoped that the situation can be so presented to the Secretary of War as to reach a satisfactory conclusion, on the general lines first recommended by the Commission.

The 1st of December the telegraph division of the bureau of constabulary was transferred to the bureau of posts. This included 307 men, 2,574 miles of land telegraph line, 198.6 miles of cable line, and 2,160 miles of telephone line, or a total of 4,932 miles of wire. During the year 172 miles of land telegraph line and 29.4 miles of cable line were transferred from the Signal Corps to the telegraph division, and 147 miles of new telegraph line were built in addition to much reconstruction. Fifty-six miles of telegraph line were abandoned, leaving at the close of the year 3,780 miles of telegraph line, 328 miles of cable, and 2,137 miles of telephone line, or a total mileage of 6,145. The military is now operating 1,406 miles of telegraph line, 1,452 miles of cable, and 338 miles of telephone line, making a total mileage—military and insular—of 9,341, of which the insular authorities are now operating 66 per cent.

The total revenues from commercial telegrams were ₱136,000 received from the public, an increase of ₱16,500, or 13.7 per cent, over the commercial business of the preceding year. In the first half of the fiscal year, when free service was enjoyed by the insular bureaus, the value of service rendered was ₱162,000, figured at the commercial rate for the same service. In the second half of this year, when the bureaus had to pay, the value of messages sent was ₱39,000, a reduction of 76 per cent, again demonstrating the wisdom of making the

bureau pay for the service they receive from other bureaus. This decrease has been without considerable loss of efficiency in the government service.

POSTAL SAVINGS BANK.

On May 24, 1906, the Commission passed an act creating in the bureau of posts a division of postal savings bank and authorizing the establishment of the same throughout the archipelago. This legislation was enacted too late in the present fiscal year to enable the postal authorities to put the same in operation before the beginning of the ensuing fiscal year. This will meet a very much needed requirement and it is believed is one of the most important pieces of new legislation which has been enacted. Many of the people of the islands are very thrifty, but inability to properly invest or secure their earnings in a manner to make them yield an income discourages thrift, and the practice of concealing money in the ground makes a serious loss to the community. The use of this money is urgently needed for the prosperity of the islands. There are now estimated to be ₱1,000,000 held in the post-offices by persons who have deposited money orders payable to themselves. This method of safeguarding money does not yield a return to the investor, nor can it be used in any way by the government or be placed in income-bearing investments.

For further information and details attention is called to the report of the director of posts, hereto attached, marked "Exhibit D."

BUREAU OF NAVIGATION.

This bureau was formerly known as the bureau of coast guard and transportation, the name being changed when the whole government service was reorganized by act No. 1407 purely as a matter of brevity.

The gross expenditures of the bureau during the fiscal year were ₱1,410,000; the cost of the light-house service, ₱336,000; the cost of light-house construction, ₱210,000; the work performed by the marine railway and repair shops amounted to ₱198,000, of which about 10 per cent was for the army and navy.

The services rendered by the bureau amounted to ₱139,000, for which bills have been rendered; ₱24,000 for the army, for which no charge was made, and ₱205,000 for insular bureaus, for which no charge was taken up this year, making a total of ₱467,000, the value of services based upon the going commercial rates for similar service, and charges for launches and cutters leased by the day or longer period at cost.

Pursuant to the provisions of act No. 1310, of June, 1905, as set forth in the last annual report, advertisements for bids were issued, offering to make five-year contracts for government service, mails, passengers, and freight, on condition that the ship should fix up visible conditions to approximate modern standards of comfort and hygiene and should so maintain them under government supervision, and cash penalties for failure to live up to the specifications were provided. The bids were opened March 1 by the acting secretary of commerce and police. There were but two bidders—the Compañía General de Tabacos de Filipinas, which bid on five of the twenty-one routes, and the Manila Shipping and Transportation Company,

represented by Smith, Bell & Co., which bid for one route, there being no bids for the other fifteen routes.

Before the bids were issued the representatives of the shipping firms in Manila were freely consulted and organized the *Asociacion de Navieros de Filipinas*, or Shipowners' Association, for the purpose of having an organization with which to confer with the government. The routes, specifications, etc., were drawn up with the approval of the directors of the association, and it was a matter of some surprise that the *Compañia Maritima*, the company operating the largest number of steamships, had not seen fit to offer a bid. This was explained by a change in the board of directors and the control of the management. The bid of the *Compañia General de Tabacos de Filipinas* was not satisfactory and was not accepted. They requested a mail subsidy which would have amounted to very much more than the whole cost of the coast-guard service on the routes which it included. In all respects, however, they agreed to live up to the specifications of the contract. The Manila Shipping and Transportation Company deviated from the strict letter of the specifications in three particulars, the first being that their headquarters was made at Cebu instead of Manila, a change much wanted by the merchants of Cebu and one which commended itself to the good judgment of the Commission. The other changes were in regard to the specifications and were of minor importance.

Negotiations were entered into with the *Compañia General de Tabacos* to endeavor to get them to so modify their bid as to bring it to a reasonable amount. This was finally done. During the progress of these negotiations the *Compañia Maritima* indicated a desire to bid and were allowed to do so. They proceeded to put in bids on eight routes, one of which had been previously bid on satisfactorily by the Manila Shipping and Transportation Company and was accordingly rejected. Two were for one-half the service on routes bid for by the *Compañia General de Tabacos de Filipinas*, which assented to the participation of the *Compañia Maritima* on these routes. Messrs. Smith, Bell & Co. submitted another bid for additional service on route 8, so that when the negotiations were finally closed there were four companies contracting for service on eleven routes, upon three of which the service was divided between two companies, leaving ten routes for which no bids have been received. The contracts as finally closed provide for annual subsidies for each route as follows:

Route 1	-----	₱34, 133. 60
Route 2	-----	30, 000. 00
Route 3	-----	11, 544. 00
Route 5	-----	38, 509. 00
Route 6	-----	14, 393. 60
Route 7	-----	20, 072. 00
Route 8 (alternate)	-----	20, 748. 00
Route 9	-----	11, 073. 60
Route 11	-----	13, 884. 00
Route 12	-----	10, 000. 00
Route 13	-----	15, 000. 00

Total subsidies (\$109,678.90 United States currency) ----- 219, 357.80

The routes reach most of the important ports of call in the archipelago—60 in number.

The contracts provide that the mails shall be carried free, that the ships shall be immediately put up to the most rigid requirements in standards of safety and sanitation, and that they shall start at a regular time, on a regular schedule, making certain stops every trip under penalty of fines imposed for each offense, the whole service to be under the direct supervision of the superintendent of inter-island transportation. These contracts for all routes but one are made for a period of five years.

The military authorities, owing to dependence on yearly appropriations, are unable to contract for more than a year at a time and so far have not seen their way clear to lay off their coastwise vessels. It is hoped that they will eventually lay off most of these vessels and thus assist the merchant marine.

A certain amount of military freight, however, is shipped on the contract ships, and the contracting lines have agreed to extend to the military authorities the same rates for service for which they contract to carry insular freight. There is a clause in the contract which provides, where contracts are made for any route with the military authorities, that the subsidy paid by the insular government is reduced according to a sliding scale based on the business done up to a total reduction of 25 per cent less than the total subsidy for that route.

Before the contracts were finally signed the *Compañía Marítima*, owing to financial difficulties, were compelled to sell six of their vessels. Messrs. Inchausti & Co., representing the new ownership, made arrangements to take over the government contract for certain of the routes and are now contracting parties for four routes, including one in joint operation with the *Compañía General de Tabacos de Filipinas*.

The first steamers under the contracts left Manila on July 12, 1906, thus it is too early to see the result.

As a result of these changes four coast-guard vessels have been laid up on Engineer Island. In addition to those the Government has been able to lease one ship to the military authorities as a dispatch boat, so that only five coast-guard cutters have been taken off, reducing the expense to the government by approximately ₱50,000 per year each, or in all ₱250,000. It will be seen that this sum is greater than the total amount of subsidies to be paid under the contracts.

The most important feature of these contracts is that the rates for all supplies and commodities, including the transportation of passengers and freight, are the same to the government and the public, and can not be increased. Any reduction must be uniform and non-discriminating to the government and public alike. The net result of this is estimated to be a saving of from 12 to 50 per cent over the existing prices according to the route and nature of service, and an average reduction of about 20 per cent of rates for all classes of service on these routes. This with regular service should tend to stimulate industry. It has been done without any apparent additional cost to the government.

At the beginning of the fiscal year there were in operation 31 vessels, including 16 coast-guard cutters, 6 smaller steamers, and 9 launches, as stated in the last annual report of the Department.

On September 25, 1905, the cutter *Leyte* was lost, with the captain, all of the American officers, 6 American passengers, and 23 of the native crew. Nine of the crew, including one Chinaman, were saved by being washed ashore.

On November 1 two vessels, the *Romblon* and the *Marinduque*, were transferred to the Coast and Geodetic Survey. In July, 1906, the coast-guard cutter *Mindanao* was leased to the military authorities as a dispatch boat.

At the close of the fiscal year the Bureau was operating:

Coast-guard cutters -----	13
Smaller steamers -----	11
Launches -----	12
Total -----	36

a reduction of 3 coast-guard cutters and an increase of 8 smaller steamers and launches. This increase in smaller steamers and launches is due to the transfer under the terms of the reorganization act of a number of provisional launches and vessels operated by other bureaus to the Bureau of Navigation for administrative purposes.

On November 1, 1905, the act known as the reorganization act went into effect. Under the terms of this act the bureau of navigation charges for all service performed for all other bureaus. Before this provision went into effect a great anxiety was observed among all the bureaus to have coast-guard vessels detailed for every kind of inspection trip or other purpose, useful, convenient, or agreeable for the bureau. Since the bureaus have had to pay for the service performed they have shown a tendency to cut down the requirements to the lowest amount necessary.

During the fiscal year the distance cruised amounted to 412,393 miles, a decrease of 46,285 miles as opposed to the preceding year. The number of ports visited was 5,650, an increase of 436. There was a decrease of 13,121 passengers and 2,923 tons of freight as compared with the previous fiscal year. The decrease in the distance covered is due to the withdrawal of boats from a number of regular routes which were operated over during the entire previous fiscal year, and of passengers carried to the discouragement of traveling for pleasure by charging for transportation.

It is recommended that the government advertise for new contracts on secondary routes with perhaps somewhat less rigid specifications to enable the existing ships to bid, and in this way extend the benefits of contract service to more ports.

Under act No. 1310 provision is made for the coast-guard vessels to charge the public rates based as near as possible on contract rates. This is now being done and it is expected that wherever coast-guard vessels ply on routes other than those contracted for they will take all business offering. As stated in the last report, it will be the plan of the government to take off these vessels wherever merchants owning steamship lines indicate their willingness to establish schedules and to apply the specifications and contract for service. Wherever coast-guard vessels ply between ports covered by contract routes provision is made that they should carry whatever passengers and freight are offered at the contract prices in order to assure the public the best service possible. The shipowners interested have agreed upon 30 per cent as a fair estimate of profit, and accordingly that

per cent of the money received in this way is to be paid over to the contracting companies to reimburse them for the profit they would have made had they had the business.

LIGHT-HOUSE SERVICE.

At the beginning of the fiscal year there were 89 lights built and in operation. At the close of the year this number had been increased to 105. These are made up of—

Flashing lights :	
First order	5
Second order	1
Third order	8
Fourth order	7
Sixth order	6
Occulting lights, sixth order	4
Fixed lights	2
Port lights	26
Lens lanterns	44
Electric arc lights	2
	105

It is respectfully recommended that appropriation be made for two third-class lights, one to be placed on the south side of the San Bernadino Straits and one on Isabel Island, near Mindoro, and twelve minor lights. With these lights it is believed that the existing needs of the merchant marine will be sufficiently provided for and that additional lights will only be needed as the business increases.

The division of light-house construction and light-house maintenance were combined on November 1 under Capt. Herbert Deakyne, U. S. Army, as light-house engineer. The service has been satisfactorily maintained, the native proving an excellent keeper of lights. During the year the condition of Engineer Island has been steadily improved, a large force of prisoners from Bilibid being employed there each day for a part of the year, and much-needed buildings have been added for different purposes.

Commander J. M. Helm, U. S. Navy, director of navigation, on his own request was relieved from duty with this government and directed by the Secretary of the Navy to take command of the U. S. S. *Baltimore*, which he did on August 10, 1905. Mr. Frank P. Helm, assistant director, was promoted to fill this vacancy, and Mr. R. M. Corwine, superintendent of interisland transportation, was appointed assistant director, thus abolishing the position of superintendent of interisland transportation as a separate office.

For further information and details, attention is called to the report of the director of navigation, hereto attached, marked "Exhibit E."

BUREAU OF PORT WORKS.

On November 1, 1905, when the reorganization act went into effect, the office of port works became known as the bureau of port works and was definitely placed in the department of commerce and police. The officer in charge is now known as the director of port works.

The bureau of navigation is charged with the maintenance of all vessels and launches and has the only marine shops belonging to the insular government. The shops of the bureau of port works have been closed and their launches transferred to the bureau of navigation, and when needed are detailed to the bureau of port works. The old quarters of the port works, on the north bank of the Pasig River, and the dry dock have been transferred to the military authorities for temporary use. This was done to give them a place for their machinery, stores, and a small shop, they having returned to the insular government the buildings and land on Calle Muelle del Rey, previously known as the quartermaster's shops.

PORT OF MANILA.

The port of Manila is now approximating its final size and usefulness, 78 per cent of the total final area of the harbor has been dredged to a depth of 30 feet, the detached breakwater is completed, has stood admirably, and is fulfilling its purpose. The west breakwater has been completed with the exception of the construction of the light-house at the end, as it was deemed advisable to allow the rock to settle before any effort was made to place heavy structures, such as a light-house, upon it. In the near future this light-house should be constructed.

During the fiscal year 1906 the expenditure of ₱1,511,000 has been made for the improvement of the harbor of Manila, which brings the aggregate of all the expenditures for this work to ₱7,604,000, and, with the expenditures on the Pasig River of ₱1,361,000, the grand total for the port of Manila, harbor, and river reaches ₱8,966,000.

The Atlantic, Gulf and Pacific Company have in a large measure completed the contract mentioned in the last annual report of this department for additional dredging of the harbor of Manila, the extension to the east breakwater being completed within 10 feet of the surface, the amount called for in the contract. This will protect the dredged area on the north, or inside of the harbor, from the silting up of mud from the undredged part to the south. Four hundred thousand cubic feet of mud has been pumped on top of the old fill and has practically dried out, and 1,000,000 cubic yards has been pumped into the new Luneta extension, leaving 600,000 cubic yards more to be placed there. To complete the present contract the director of port works feels it will be necessary to wait for additional dredging to bring this extension up to the estimated height. One hundred and thirty thousand tons of rock have been placed in the filled breakwater and 1,400,000 cubic yards have been dredged.

The 1st of May a small section of the Luneta extension bulkhead slid out. Before this could be repaired the typhoon of May 18 destroyed 1,500 additional feet, the liability for the repair of which is in dispute, a matter which will come up for settlement shortly. The old retaining wall for the filled-in land is rapidly deteriorating and must be shortly replaced its whole length. The replacement should be a permanent concrete wall, at an estimated expense of ₱200 per foot, for the first section of which request is made in the present appropriation bill. This is an urgent necessity and can not be delayed.

Plans and specifications for two large steel and concrete wharves, one 600 by 70 feet and the other 650 by 110 feet, have been completed, an advertisement issued, bids opened, and contract awarded to the Atlantic, Gulf and Pacific Company for ₱886,046.59. Advertisements are now out for sheds to cover these wharves, and bids are to be opened October 15. The completion of these wharves, which should be by May, 1908, should have a very marked effect on the carrying trade of the Philippine Islands, and plans are now being prepared for an adequate system of approaches to the wharves by means of roadways, railways, and otherwise so as to enable the merchants to handle their goods in a most economical manner.

The military authorities have completed a 500-foot wharf, 60 feet wide, adjoining the reservation of the site for their use on the filled-in land. On the 12th day of September, 1906, the transport *Logan* was laid alongside of this wharf, which marks the beginning of a new era in the history of the Philippine Islands. This is the first large trans-Pacific liner to lie beside a wharf in the islands.

SURVEY PARTIES.

Two survey parties have been continuously in the field and have investigated the ports likely to be most used by the railroads. The ports already visited are the Danao River, the southern terminus in Cebu, and Escalante, the northern terminus of the railroad in Negros; also Batan and Capiz, the two northern termini of the railroad in Panay. This bureau is also studying the problem of making a port of Tagbilaran, the capital of Bohol, and has investigated Dagupan, the northern terminus of the existing railway, Santo Tomas, San Fernando, and Aparri, the proposed ports along the northern, eastern, and western coasts of Luzon.

IMPROVEMENT OF THE PORT OF ILOILO.

Expended up to the beginning of the fiscal year 1906, ₱92,146; expended during the fiscal year, ₱207,612; total expended to date, ₱299,758; estimated amount necessary to complete the contract, ₱176,056. This will give a harbor with a mean depth of 15 feet for Iloilo. One hundred and eighty thousand cubic yards have been dredged from the channel out of an estimate of 450,000, and a total of 21,700 tons of rock have been put in place.

IMPROVEMENT OF THE PORT OF CEBU.

Amount expended at the beginning of the fiscal year 1906, ₱8,974; amount expended during the fiscal year, ₱242,953; total expended, ₱251,927; total estimated to complete the project, ₱948,067.

For further information and details attention is called to the report of the director of port works, hereto attached, marked "Exhibit F."

COAST AND GEODETIC SURVEY.

With the beginning of the fiscal year the bureau had in operation three large steamers—the *Pathfinder*, *Fathomer*, and *Research*—and one chartered launch. On November 1 two coast-guard cutters, the

Romblon and *Marinduque*, were transferred from the coast-guard service to the survey service on a basis of joint operation between the Philippine government and the United States Government, as has been the practice in the other coast-survey work. As soon as the necessary alterations were made to equip these vessels for survey work they were sent out and, except when they report for repairs and supplies during their movements from working ground to another, necessitated by the semiannual change of the monsoons, they are continuously at work.

At the end of the fiscal year there were seven steamers engaged on general survey work—five large vessels and two chartered launches—and an additional chartered launch used by the party which extended the main triangulation to *Marinduque*.

Attention is called to the experience of the *Pathfinder*, which was in the center of the path of the very severe typhoon of September 25 and, although anchored with two anchors out and full steam ahead in a protected harbor, was blown ashore and considerably damaged. The barometer of this vessel during the storm registered the lowest mark ever observed in the Philippine Islands—27.16 inches.

At the beginning of the fiscal year it is estimated that the equivalent of 1,215 statute miles of general coast line was completed out of a general total of 11,511 statute miles, or $10\frac{1}{2}$ per cent. The returns from the steamers at sea are not all in with their compilations, so that an accurate statement can not be made as to the exact amount of work completed. At the close of the fiscal year it is estimated that 430 additional miles have been completed during the past year making a grand total of 1,645 miles completed, or 14.3 per cent of the coast line of the islands.

The cost of this service during 1905 was \$190,425, not including the cost of instrumental equipment and construction of vessels. Of this expense 63 per cent was paid by the United States and 37 per cent by the Philippine Islands. Of the total expenditure in 1906 of about \$262,500, 66 per cent has been paid by the United States.

During the fiscal year the bureau published 14 Notices to Mariners, 3 volumes of Sailing Directions, Catalogue of Charts, and other pamphlets. In the year 1906 the number of charts sold or issued for official use was 7,615, the number sold amounting to 1,774, an increase of 100 per cent over the number sold in 1905, and 230 per cent over those so disposed in 1904. There have been published in Washington 18 new Philippine charts and 9 new editions or new prints of charts, a total of 27 charts.

In addition to the services rendered by the publications mentioned the main office of the survey in Manila maintains a very close connection with the shipping interests, its aim being to aid with all its resources in giving the earliest possible publicity to all hydrographic information of value to navigation it secures.

The addition of the two steamers transferred during the fiscal year and the services of the chartered launches provide for the employment of at least seven field parties, usually eight, and insure a marked increase of progress in the work of completing accurate and permanent surveys of the islands. However, even at the rate of work which we are now in position to maintain it will take twelve years to complete the surveys of the islands. This is much too slow

for the interests of commerce and it is hoped that the United States and the Philippine Islands can extend the present arrangements so as to put one or two more coast-guard vessels at work on surveys, as there are now four tied up owing to the contracts made with merchant vessels for government business on interisland routes. It is respectfully recommended that provisions be made for the detail of two additional vessels for this service provided the necessary appropriation can be made.

On July 15 Mr. Putnam was relieved from the service and detailed to other duty with the Department of Commerce and Labor in the States, to the regret of the insular government, as his services had been uniformly satisfactory and efficient. Mr. McGrath, who was formerly his assistant and is therefore well acquainted with the problems connected with this work, was appointed director to take the place of Mr. Putnam. The work will continue along the same lines for the ensuing year.

For further information and details regarding the work of the coast and geodetic survey during the fiscal year 1906 attention is called to the annual report of the director of coast surveys hereto attached, marked "Exhibit G."

Respectfully submitted.

W. CAMERON FORBES,
Secretary of Commerce and Police.

To the PHILIPPINE COMMISSION,
Manila, P. I.

EXHIBIT A.

REPORT OF THE DIRECTOR OF CONSTABULARY.

BUREAU OF CONSTABULARY,
Manila, P. I., August 31, 1906.

SIR: I have the honor to submit herewith my report for the fiscal year ending June 30, 1906, plus the interval to include August 31, 1906.

Since last report the provisional district, consisting of the provinces of Cavite, La Laguna, Batangas, and part of Rizal, has been returned to the first district, and in order to facilitate its supply and administration the province of Benguet has been transferred from the fourth to the first district. The second, third, and fifth districts remain unchanged.

During my absence in the United States, Colonel Baker was in charge until his ill health, due to arduous service, compelled his departure on leave, when he was relieved by Colonel Bandholtz. It is but just to make mention of the entirely satisfactory manner in which the acting directors and the district directors accomplished their duties during the entire period covered by this report. The greatly improved conditions throughout the archipelago are in a measure due to the skillful work and administration of them and their assistants.

On June 30, 1906, the enlisted strength of the constabulary, including the medical division and the constabulary band, was 4,932, occupying 147 posts. The number of scout companies on duty with the civil government was steadily decreased until on June 1, 1906, there were none on such duty; however, on June 26 the Second Company of Scouts stationed at Samal, Bataan, was called upon for assistance in the operations against the Santa Iglesia organization, and on July 23 was relieved from that duty. On July 17 the Eighth Company of Scouts was called upon to garrison Dagupan, Pangasinan, in order to allow the constabulary of the province to take the field. It was relieved from this duty August 25.

PEACE CONDITIONS.

FIRST DISTRICT.

The recent surrender of the principal ladrone leaders in Rizal, Cavite, and Batangas provinces—Macario Sakay, Francisco Carreon, Julian Montalan, Benito Natividad, Lucio de Vega, and Leon Villafuerte (the first named being the so-called president of the Filipino republic, the second the vice-president and secretary of war, the third lieutenant-general, etc.)—frees the above provinces and La Laguna from practically all organized bands. Not more than 12 guns are known to be in the hands of unauthorized persons in those provinces. Well-merited official recognition has been given Colonel Bandholtz for his most successful work by both the Secretary of War and the governor-general. March 1 Cornelio Felizardo, second in command to Montalan but first among the outlaw leaders in initiative, activity, and brutality, was killed by two privates of constabulary.

On the night of Easter Sunday, April 16, 1906, members of the Santa Iglesia organization under the leadership of Manuel Garcia attacked the constabulary cuartel at Malolos, Bulacan, killed one constabulary soldier, and captured 16 carbines with 600 rounds of ammunition. The band was promptly pursued, but no decisive encounter occurred between the outlaws and the Government forces until July 9, when Lieutenant Reyes struck the band in a barrio of Hagonoy, killing the leader, "General" Garcia, with most of his followers. Continuous operations have been carried on since that time, with a gradual decimation of their forces and guns.

This fanatical organization (Santa Iglesia) under the leadership of Felipe Salvador has many followers throughout the provinces of Bulacan, Pampanga, Nueva Ecija, Tarlac, and Pangasinan who furnish it an effective system of information and protection.

At this time this is the only disturbed section of the first district. The following is a brief history of the organization taken from Colonel Banholtz's report:

"The society purports to be a religious one, the members being given or sold crucifixes or rosaries by Salvador and using forms of worship similar to those in the Catholic Church. Salvador preaches socialistic doctrines to the believers, practices polygamy, and promises them that land and other desirable things will be distributed among his followers when he shall have overthrown the Government and taken possession of the country himself, that there will soon be a great flood or fire that will destroy all unbelievers, and that after this purging of the country there will be a rain of gold and jewels for the faithful. He has a number of firearms, and one of his purposes is to attack police or constabulary detachments when practicable in order to obtain more arms. When he desires to make a raid he has no trouble in augmenting his armed bodyguard with a number of bolomen and others armed with clubs. He states to his followers that the clubs will turn into guns if they are bravely used against Government forces. Salvador's headquarters are on Mount Arayat, and he claims that occasionally his spirit takes flight for the purpose of visiting and interviewing the heavenly powers.

"It is stated that the society was originally a revolutionary one started by one Gabino, a native of Apalit, Pampanga, who, upon his capture in 1893, is said to have been shot by the Spaniards in the plaza at Apalit.

"Felipe Salvador, the present leader, appeared upon the scene in 1894 and reorganized the society, changing its name from 'Gabinistas' to the 'Santa Iglesia.'

"Salvador and some of his followers assisted in the attack by the Filipino revolutionary forces on the Spanish garrisons at Dagupan and Lingayen in 1898 and there Salvador secured about one hundred rifles. This made him so powerful that the revolutionists took him into the forces of the Filipino insurrection through fear. Later Salvador was made, by Aguinaldo, a colonel in the revolutionary forces in 1899. When the forces of the insurrection in his province surrendered to the Americans, Salvador refused to recognize the surrender and became an outlaw. He had already lost most of his arms, and by deserting his post at Marilao on the approach of the Americans had been branded as a deserter by the insurgent leaders who themselves attempted to capture him.

"He was finally arrested by the constabulary in Pampanga in 1902 and convicted of sedition. He, however, escaped from jail and has been an outlaw ever since. Curiously enough, after his escape from jail, his conviction was set aside by the supreme court for some reason."

SECOND DISTRICT.

This district has been entirely free from outlaw bands except in the extreme northern portion of Tayabas Province, adjacent to Kasiguran, where a small band under the leadership of Pautaleon Villafuerte found refuge and had existed since the close of the insurrection. In July, Governor Queson, of Tayabas, and Major Borseth made an expedition there, and on July 11 succeeded in killing Villafuerte and capturing all his followers with their arms. The extinction of this party leaves only Juan Kabayo out in the second district, but he has practically no followers. No guns, so far as known, remain in the hands of unauthorized persons.

Attention is invited to the following from Colonel Harbord's report, which is found to be true of other districts than the second:

"American prestige in this district is injured by the presence of worthless specimens of our race—men without visible means of support other than that afforded, perhaps, by a 'tienda' kept by a Filipino consort, but enough to prevent conviction for vagrancy. These men, by virtue of a white face and American birth, affect to patronize Filipinos of many times their intelligence and morality, and assume an attitude toward the Government and people which neutralizes to some extent the best efforts of respectable Americans, official and unofficial, to bring the people into sympathy with the aims and ends of our country in this archipelago."

THIRD DISTRICT.

Samar.—In spite of the considerable federal force employed during the year, the pulahanes of this province have not been wholly suppressed.

On July 28, 1905, Captain Jones, with Captain Green, Lieutenant Hemmett, American Scout Wiggins, and 68 constabulary were attacked from both sides of a narrow trail by a large force of pulahanes. After severe fighting the outlaws were driven off with a heavy loss, the constabulary casualties being six enlisted men killed, and Captain Jones and five enlisted men wounded.

A few months after Governor Curry's appointment to Samar he began negotiations for the surrender of the pulahan leaders with their followers and arms. Conferences were held at Mugtaon between him and the leader, De la Cruz, whereat arrangements were finally made for the surrender to take place March 24. At the appointed hour the pulahanes began to arrive, and soon a force estimated at 200 formed in front of the constabulary barracks. During a conference between Governor Curry and De la Cruz, Captain Jones, commanding the constabulary, became suspicious of the motives of the pulahanes and slowly made his way around the flank of their ranks toward the barracks. While still some distance from it the pulahanes, at a signal from the leader Aguilar, opened fire on all Americans present and on the constabulary barracks which they rushed with spears and bolos. In the hand-to-hand fighting which followed 22 enlisted men were killed, and Captain Jones, Lieutenant Bowers, and 11 enlisted men wounded, being a casualty loss of 86 per cent of the force engaged. The judge of the court of first instance of the district, the provincial governor, and the superintendent of public schools effected their escape without injury.

Captain Jones succeeded in securing his carbine; and, although twice wounded early in the fight, rallied the surviving soldiers and by his personal bravery and skill finally dispersed the pulahanes, who left 43 dead on the field.

This engagement presents another strong argument for the rearmament of the constabulary with Krag-Jorgensen rifles or carbines with bayonets. Most of the loss among the enlisted men was caused by bolo and spear thrusts. After once discharging their single-shot Springfields they had great difficulty in re-loading and at the same time keeping out of reach of the heavy bolos of the fanatics.

At present seventeen companies of scouts and four companies of American troops under Colonel Smith, Eighth United States Infantry, are operating against the pulahanes, but with success that will be largely dependent upon time and attrition. The mountain fastnesses and the roadless interior afford fairly secure refuge and sufficient food for the existence of the outlaws. The entire Twenty-first Regiment is also in Samar.

The pulahan organization still at large in Samar are under the leadership of Pablo Bulan, alias Pope Pablo; Pedro de la Cruz; and Isidro Pompac, alias Otoy. Their followers are the remnants of the old Dios-Dios bands, later known as "Cazadores," and a large number of criminals who fled from justice in the coast towns, together with a number of ignorant people who prefer the mountains and jungle to civilized communities. Pope Pablo is the religious head of the outlaws in Samar; Pedro de la Cruz is the "Superior Chief of Operations." Their total number of rifles does not exceed 60.

Leyte.—On June 19, 1906, the municipal police of Burauen were attacked by the pulahanes under the leadership of Felipe Ydos. Five policemen were killed, and 14 of the 15 rifles with which they were armed were secured by the outlaws. Prompt pursuit was made by the constabulary, but without decisive results.

The acquisition of these guns won many recruits to the pulahan ranks, and the section adjacent to Burauen became greatly agitated. Additional constabulary was sent to Leyte from Samar and Cebu under Major Nevill, who at once reported the situation grave. On July 6 Major Nevill with 36 men attacked a strongly entrenched position in the mountains one and one-half days west of Burauen, with a loss of 7 men severely wounded, who fell during the assault into pitfalls filled with spears. The wounded and the smallness of his force prevented further action until a few days later, when they fled from the intrenchments on his approach with a larger force.

On July 17 Lieutenant Williams with a detachment of constabulary attacked a strong force of pulahanes, killing one and capturing a quantity of supplies. On July 21 information was received of a small band near Burauen, and Lieutenant Williams, with Lieutenant Worswick, American scout McBride, and 34

enlisted men, attacked them about 2 miles west of the road between Burauen and Dagami. About 200 pulahanes rushed the line from the tall grass and dense underbrush bordering the trail, cut off and killed 12 enlisted men and also Lieutenant Worswick and American scout McBride. Lieutenant Williams succeeded in rallying his men and made his way to Dagami. A reenforced column immediately returned to the field, but could not find the pulahanes. By this time American troops (parts of the Eighth and the Twenty-fourth Infantry) had reached the field.

On July 24 Major Nevill, with Lieutenants Jeancon and Williams, Subinspector Yasay, and 50 enlisted men of the constabulary, and Captain McMasters, Twenty-fourth United States Infantry, with 26 men of his company, struck a force of pulahanes numbering 450 at Tabontabon. The pulahanes made three distinct rushes, but were driven off with severe loss each time. They left 49 dead upon the field and had a large number of wounded.

Captain McMasters, with 6 American soldiers and 4 constabulary, comprising the advance guard, became separated from the main body under Major Nevill; at one time they were compelled to use clubbed guns in the hand-to-hand fighting with the enemy.

This engagement reflects great credit upon the officers and men participating in it; had the force been less judiciously handled it would have suffered a decided disaster. Two Springfield carbines, 1 Winchester shotgun, and 2 old guns were captured. The first sergeant of constabulary was wounded, and 3 constabulary in charge of cargadores were cut off and killed.

The following is from a report made by me from Tacloban, Leyte, July 29:

"It was indeed fortunate that the active assistance of troops was not asked for later than was actually done. General Wood's telegrams were quickly responded to by General Lee and Colonel Borden. The celerity of the transfer and the speed with which the troops took the field unquestionably saved some of the large towns of the island. For this the insular government is primarily indebted to General Wood and General Lee, and secondarily to the cooperation of Colonel Borden and his officers with the constabulary on this island. There have been no troops brought in since the arrival of the six companies of the Eighth Infantry, for which orders were given prior to my arrival. General Lee holds ready at Cebu other companies to bring to the west coast of Leyte on request from Colonel Taylor to participate in operations from Albueria and Ormoc."

This movement is not unlike that which has caused so much disaster to Samar. It represents the accumulated resentment of many years, possibly many generations, of the country people against the town people or rather against the municipal officials and the controlling classes. This is in general the chief cause of pulahanism. The people who participate therein are, as a rule, so ignorant that they know of no other method of securing redress than by an appeal to arms.

The rapidity of the growth of this movement in Leyte was truly astonishing. With it are mingled fanaticism and the usual spirit of plunder. The center of the movement continues to be the section adjacent to Burauen; and though it has spread to various localities in the northern half of the island, its progress has been effectively checked.

In the island of Cebu during the past year unimportant engagements have occurred from time to time between the constabulary and the outlaws. On June 24, 1906, Quintin and Aday, the well-known bandit brothers, with their followers surrendered to Governor Osmeña, thus practically freeing the province of organized outlawry. Governor Osmeña's work in this direction reflects great credit upon himself and his province.

The other provinces of the third district have been fully as peaceful as could have been anticipated.

I desire to invite special attention to a peculiar class of work done by the constabulary in the third district under the supervision of Colonel Taylor, viz, the organization of semicivilized mountain people into civic communities. The following from his report gives a general idea of the character of the enterprise referred to:

"The work of the constabulary has been greatly hampered by the reduction in force and the shortage of officers. There are several mountain districts inhabited by a class who would require very little to incite them to raiding

and plundering. Garrisons should be established among these people, and they should be required to recognize existing laws and conditions. We have done what we could along this line with the force at our disposal, but outbreaks like Burauen will continue to occur so long as we do not dominate these partially civilized mountain people. The feeling which exists between mountain and town people breaks into open warfare only too readily, due to the efforts of municipal officials to enforce compliance with their authority, and to the presence among the mountain people of a few strong characters, or their friendliness to some outlaw leader who is ever ready to join any move against municipal authority. My experience in Samar, Leyte, Cebu, and Panay is that when the mountain people can be brought under the influence and the protection of a post of constabulary, the would-be leaders of pulahanism and ladronism can not muster sufficient force to do any particular damage, and gradually the desire for peace and prosperity becomes paramount. In Samar, Leyte, and Cebu mountain barrios have been formed, schools and churches built, and the acreage of cereals and vegetables increased to a wonderful degree—all by the constabulary on its own initiative and supported only by the good will of the people. Our curtailed strength prevents the extension of this work."

FOURTH DISTRICT.

In this district no organized outlaw bands are at large, and the field work of the constabulary has consisted of punitive expeditions against head-hunting rancherias. Great strides have been made in the elimination of the practice of head-hunting, and tribes and rancherias have been brought into closer and more friendly contact than has ever before existed. A general estimate of the peace conditions and of the people is well set forth in the following extract from the report of Major Crawford:

"The subject of peace conditions in the fourth district must refer naturally to the relations which exist between the different rancherias of Igorots, Calingás, Ilongotes, or Negritos within the cordilleras as between themselves, or with relation to the Tinguianes on the west side of the cordillera and the Christians. There is nothing extant among either the Ilokanos or Cagayanos against the constituted government. There is no such thing as organized bandolerismo having the pretensions of a political movement in the fourth district. It is only when an ambitious politician comes from Manila that the subject of ultimate or speedy independence is ever discussed. Now, that the time for the selection of members of the assembly approaches, many natives of the northern provinces now residents of Manila return and try, through spellbinding on independencía, to make themselves 'favorite sons.'

"A ladrone raid into Isabela from the south, and in which Palauan was the victim, and the bungling work of two crude robber bands in La Union are the reminders the people here have of the troubles of their less fortunate countrymen in the southern provinces. In the case of La Union the conditions are due to a lack of strict surveillance by a wide-awake senior inspector. Maladministration by municipal police officers have contributed to the unsavory conditions. The carabao thieves in Ilocos Norte and Cagayan and Ilocos Sur have had their operations materially curtailed by the activity of the senior inspectors and forces in these provinces. The cooperation of the police in Ilocos Norte and Cagayan was a potential factor in the carabao campaign. The campaign against the slave trade and conciliation between Calingás and Christians in Isabela was brought to a standstill or retarded when the First Company was taken out of the district, and but little can be done until it returns.

"All resources available in the district are thrown in the direction of peace-making and in drawing the mountain people within the pale of civilization. This district has within it, among its primitive people, a promising prospect for the future. There are 200,000 people, and possibly more, in this district who now figure but little politically. These people, virile and untainted by the vices, can by careful and generous treatment be made a positive quantity in the body politic in a very few years.

"There is no longer any question about the ability of the government to handle the Igorot. Aside from his head-hunting, which he is giving up under the influence of constabulary intercession and peacemaking, he is proving himself a loyal and uncomplaining subject. His industry and conquest over waters which fall from the heavens and the slopes and pockets of the mountains have only been limited by his necessities. The stimulating touch of American civilization

has increased his wants, sharpened his wits, and aroused his genius, and he has begun to knock at the doors of commerce with the products of his cultivation or his handiwork.

"Formerly his traditional head-taking confined him to his rancheria. Now, under the new order of peacemaking, the Igorot of Balbalasan goes through Lubuagan and scores of other rancherias to Bontoc and thence to the coast, or a Banaue man from Nueva Vizcaya can come alone to the coast at Candon; Gaan and Tolocotoc people cross the divide and come to Lubuagan. These trips would have been impossible of accomplishment two years ago."

In spite of the above, Major Crawford and the senior inspector of Cagayan (Captain Knauber), with a small detachment, were jumped, August 4, 1906, by Calingas while rafting through a narrow defile of the Apayo River, and both officers were wounded with arrows.

FIFTH DISTRICT.

By the death of Datto Ali in October, 1905, and the surrender of his followers with about 200 arms to the Federal forces the central portion of Mindanao was freed from armed opposition to the government and has since been peaceful.

In 1905 an outlaw element of the island of Jolo took up their residence on Mount Dajo, an extinct volcano about 5 miles from the town of Jolo, with the permission of Governor Scott, upon condition that they pay their taxes, commit no depredations, and harbor no outlaws among them. They ignored all these promises, strongly fortified their position, and defied the authorities.

After all peaceful means were exhausted, force was resorted to and the position was attacked on March 6 by a force consisting of 450 Federal troops and parts of two constabulary companies. This engagement has been fully reported by the military authorities. The small constabulary force was highly commended by the division and department commanders for its work. Its casualties (36 per cent) were 3 killed and 15 wounded, including Captain White.

In March of the present year 7 enlisted men confined in the jail at Dapitan, Zamboanga district, escaped from their guards, secured their arms, and opened fire upon their comrades while the latter were at dinner. They killed 2 and had 2 of their own number killed. The remaining 5 fled to the mountains with 5 Springfield carbines. After several weeks' pursuit 4 of the 5 were killed, the 1 survivor still being in hiding with his gun. This is the second affair of this character which the constabulary has to record during its five years' existence, and, like the former, the results will not foster others.

On June 6, 1906, Governor Bolton, of Davao district, was foully murdered, together with Mr. Christian, a Davao planter, by a Tagacolo subchief, Mangalayan. American troops, scouts, and constabulary immediately took the field in search of the perpetrators. About the middle of August a detachment under an American sergeant killed the murderer after an engagement in which several soldiers were wounded.

The constabulary of this district, excepting that of the provinces of Surigao and Misamis, bears in a measure the same relation to the governor of the Moro Province that the constabulary of the islands bears to the governor-general. The governor of the Moro Province has seen fit to utilize constabulary officers in various purely civil positions. One is governor of a district, three are deputy governors, one is a district secretary, others are presidents, tribal ward justices, and supervisors of Moro exchanges.

The field of work among the Moros and the mountain people of this district is extensive; but, due to the limited personnel available for meeting it and to the conservatism of these people, progress must be slow. The work, however, is highly interesting and demands the best class of officials that can be obtained. It is a mistake to suppose that, savages though these people be, they are not remarkably clever in discerning character, and in recognizing true manhood among those set over them. Officials of a superior moral and mental fiber are not less necessary here than in the more advanced parts of the archipelago. The following from the report of Colonel Scott indicates the character of the work required of officers in his district:

"The constabulary of this district is by the organic act of the Moro Province placed under the command of the governor of the province. It was the policy of my predecessor, and I am making it my own, to encourage the use of the constabulary by the district governors to assist them in the civic administration

of their districts. In various instances it is being done, to the credit and experience of constabulary officers. While a strict construction of the law would perhaps not authorize this, common sense and policy demand it. The duties of officers are too numerous to make mention of all, but the following are some of the principal ones: District governors, deputy governors, judges of tribal ward courts, justices of the peace, deputy sheriffs, supervisors of Moro exchanges, etc. The conditions vary so much in different districts that no general rule of conduct is laid down, but such instructions are given each individual officer, with the approval of the provincial governor, as enable him to utilize them as a general guide for his actions. Due to this system, the field of usefulness of the constabulary is largely increased, and the Moro Province secures, without extra expense, the services of experienced officers."

Attention is also invited to his remarks concerning the exploring expeditions and the slave trade.

CHIEF SUPPLY OFFICER.

Since last report the telegraph division has been transferred from the bureau of constabulary to the bureau of posts and the sales commissary in Manila to the bureau of supply. With a view to economy the ordinance division has been incorporated with the commissary. The officer charged with the supply of the constabulary bureau has a difficult task, to which the present incumbent has been fully equal. His concise report is submitted herewith.

I desire to invite your attention to the fact that, owing to the natural conditions existing in this archipelago, the cost of transportation must necessarily make great inroads into the constabulary appropriations, and to the fact that with a diminution of our forces the greater becomes the necessity for frequent moves, and therefore an increased demand for transportation. Last year the bureau of navigation alone charged us with ₱112,000 for hire of cutters and launches. The demand for water transportation is not less urgent this year than last.

The following very satisfactory condition as to supply officers is from the report of the acting chief supply officer, Captain Hersey:

"During the fiscal year 1905 provision was made for the paying of extra compensation to constabulary officers detailed as supply officers. There were in all 52 of these. That this was a wise provision has been fully demonstrated during the past year, in which it has been found practicable to reduce the number of these officers from 52 to 35 at the close of the year. This large decrease in force has been due to several causes, among which might be mentioned the increased efficiency of its personnel, made possible by the extra compensation authorized in act No. 1416, the more peaceful conditions obtaining in several of the provinces, the more thorough systematization of the work, and the better transportation facilities. The work of consolidation is still going on wherever possible, and it is believed that with each ensuing year this branch of the bureau will be operated at a decreased cost. The duties of a supply officer are many and varied, and it is gratifying to be able to state that during the entire year there has been no case of malfeasance in office."

COST OF THE CONSTABULARY.

During the fiscal year 1906 there has been expended for this bureau ₱3,725,761.10, a reduction from the expenditures for 1905 of about ₱400,000 in spite of much field service in various portions of the archipelago. A considerable part of this saving, however, is the result of transferring the telegraph division from this bureau to the bureau of posts. The amount appropriated for the present fiscal year, ₱3,068,000, shows a further decrease of about ₱675,000. During the coming year a saving will result from the further abolition of civil supply stores throughout the islands and sundry measures of retrenchment in other divisions.^a

^aA table showing the result of operations for the present year, by districts, also a comparison with the preceding year, accompanies this report and is on file in the War Department.

CASUALTIES.

During the period covered by this report the following casualties among constabulary officers have occurred:

Name.	Deceased.		
	Cause.	Place.	Date.
Taylor, Second Lieut. V. H.	Drowned	Tarlac, Tarlac	Sept. 2, 1905
Thorp, Third Lieut. C. A.	Typhoid	Camp Connell, Samar	Sept. 14, 1905
Sommer, Second Lieut. R. O.	Drowned	At sea	Sept. 26, 1905
Lovejoy, Capt. C. D.	Dysentery	do	Jan. 13, 1906
Gunnison, First Lieut. Def. M.	Cholera	Macabebe, Pampanga	July 12, 1906
Worswick, Third Lieut. J. G.	In action	Burauen, Leyte	July 21, 1906

Name.	Wounded in action.		
	Nature of wound.	Place.	Date.
Jones, Capt. R. W. (2)	Thigh, groin, slight (spear)	Samar	July 28, 1905
White, Capt. J. R.	Knee, severe (bullet)	Jolo, Jolo	Mar. 7, 1906
Jones, Capt. R. W.	Chest, severe (spear)	Mugtaon, Samar	Mar. 24, 1906
Bowers, First Lieut. G. B.	Arm, severe (bullet)	do	Do.
Crawford, Maj. S. D.	Wrist, slight (arrow)	Cagayan Province	Aug. 4, 1906
Knauber, Capt. H.	Leg, slight (arrow)	do	Do.

MEDICAL DIVISION.

I desire to especially invite the attention of higher authorities to the reasons set forth in the various reports which accompany this one as to the importance and desirability of continuously maintaining a small, economically administered medical division. It is not just to subject people to the vicissitudes of maintaining public order without giving them effective medical protection. To depend upon the bureau of health for this can not be considered satisfactory, as recent events have shown. The personnel of the medical division can not be carried to the field, as was done a few weeks since, when it became necessary to call upon a member of the bureau of health for assistance in an infected locality of Leyte. Instances could be multiplied here showing where the constabulary medical division has saved lives of various members of this organization, as well as contributed largely to the sanitation and health of districts so remote that in all probability they would rarely if ever be visited by an official of the bureau of health.

OFFICERS.

A continuous effort to raise the standard of officers has been maintained throughout the period of this report. With this end in view the constabulary school at Manila has been developed as fast as was consistent with the urgent demands for officers in the provinces. New officers, usually graduates of universities and colleges, when brought out from the United States are, by a special course of instruction at the constabulary school, more thoroughly fitted to exercise civic functions and to maintain that cooperation and relation with the people required in the successful operations of the bureau. The result of this training is demonstrated in the harmony and mutual assistance between the constabulary and the provincial and municipal officials and the people throughout the provinces and in the generally improved conditions that prevail.

A request has recently been made to have annually four of the Filipino graduates of American institutions incorporated into the constabulary corps, and if this is effected they, too, will be required to pass through this school.

The director of education has also been requested to recommend annually six graduates of the most advanced educational institutions under him for appointment as subinspectors; these upon being so designated will be required to take the special subinspector's course in that school.

Major Mair, who has had charge of this school, and his assistants have, under difficult circumstances, accomplished very satisfactory results. The curricula for the coming year are here set forth.

STUDENT OFFICERS' COURSE.

5.40 a. m. to 6 a. m.—Setting-up exercises. Butt's Manual.

7 a. m. to 9 a. m.—Aiming and sighting drill, gallery practice, saber drill; fencing, broadsword and bolo; infantry drill four days per week; equitation one day each week.

9.55 a. m. to 10.55 a. m.—Instruction in Spanish and native dialect by recitation, practice in pronunciation, blackboard and written exercises, five days per week.

11 a. m. to 12 noon.—Constabulary orders, constabulary circulars, constabulary regulations, twenty days; constabulary paper work, forty days; constitutional law, including McKinley's instructions to the Philippine Commissioners, three days; municipal code, five days; provincial code, five days; acts of the commission affecting the constabulary, five days; penal code, with lectures on criminal law, fifteen days; lectures on Philippine judiciary, aim and work of the public schools, and non-Christian tribes, three days; miscellaneous lectures, subjects to be selected, five days; forestry laws, land laws, agriculture, mining, bureau of health, transportation, supplies, and care of property, four days.

3 p. m. to 4 p. m.—Recitation in infantry drill and guard duty, twenty-six days; recitation in criminal procedure, general orders, No. 58; summary court procedure, justice of the peace act; bandolerismo, vagrancy, sedition laws, and cattle registration act, sixteen days; law of arrests, internal-revenue law, four days; topography and map reading, twenty-five days; Philippine history, ten days; Philippine assembly law, one day; official courtesies, one day; company administration, three days; recitations and lectures on evidence, fifteen days.

All day.—Lectures by medical officers upon diseases of the eye, first aid to wounded, sanitation, and tropical diseases, four days. Ten days' field work, dates to be determined. Horseback riding during recreation hours.

SCHEDULE OF INSTRUCTION FOR ENLISTED MEN FROM THE VARIOUS PROVINCES COMPRISING THE INSTRUCTION COMPANY AT THE SCHOOL—TERM, FOUR MONTHS.

6.30 a. m. to 7.20 a. m.—Constabulary regulations, general orders, guard duty, general orders, No. 81, series 1904, recitation, four days per week; saddling, care of horses, practical instruction, one day per week.

7.30 a. m. to 9 a. m.—Infantry drill, and aiming and sighting drill, gallery practice, five days per week.

10.30 a. m. to 12 noon.—Arithmetic, geography, writing, five days per week.

2.30 p. m. to 3.30 p. m.—Bolo fencing, three days; athletics, two days; English, reading, and composition, five days per week.

4 p. m. to 5 p. m.—Records and correspondence and English (reading), five days per week.

At this institution an effort is made to fix the standards for the constabulary from private to senior officer; it is a school for training noncommissioned officers as well as commissioned ones. An inspection of the newly graduated officers at their various provincial stations and the reports made upon them by their seniors clearly demonstrate the value of the school. The constabulary has been charged with excessive militarism by persons who have failed to recognize that the best police forces, wherever they may be found, must have cohesion and discipline, and that only one way has so far been evolved or developed by which this can be effected, and that is by a strict military system. This is not a new principle; nor can its necessity be ignored by those who have to be responsible that this force shall have ample courage and grit, the result of cohesion and discipline, to meet the difficult field tasks that confront us from time to time.

It does not follow from this that the purely civic duties of the constabulary are not given precedence in the instruction throughout the islands, and above all through the officers at the constabulary school.

Until the conditions have become far more advanced than at present it will be necessary to employ constabulary chiefly in detachments—which, however, continue to grow smaller each year—and these can be made truly efficient only by a strict application of a system which has been recognized the world over for many generations.

In his annual report of the Moro Province General Wood states the following: "The constabulary have been on duty on several occasions in conjunction with troops. They performed most gallant and efficient service during the assault on Mount Dajo, and earned the commendation and respect of the troops with whom

they were associated. The organization is a good one and, considering the short time it has been organized and the service it is called upon to perform, its showing is excellent."

The success of the constabulary and its importance to the insular government is entirely dependent upon the quality of the officers. In spite of the great improvement in this direction, the standard must yet go higher, and to effect this greater inducements must be offered. Experience has fully demonstrated that only men of fine moral and mental fiber can make high-grade constabulary officers, and characters of this class can only be secured by proper compensation for their services, which have a market value throughout the States and here.

The following circular embodies the dominant spirit of constabulary instruction that has been inculcated throughout the entire personnel of the organization:

"CIRCULAR }
No. 33. }

"BUREAU OF CONSTABULARY,
"Manila, September 15, 1905.

"The following extracts from letters from the chief of constabulary to the district chiefs are published for the information and guidance of all officers, who will carefully study them in connection with General Orders, No. 66, current series, this office:

[Letter of July 22, 1905.]

"With reference to General Orders, No. 66, recently published, there are allied matters to which I desire to call the attention of the district chiefs with a view to having them instruct their officers therein.

"District chiefs must be personally well acquainted with the governors and other members of the provincial boards in their districts as well as with the officials of the towns and the principal citizens thereof. They will also require their officers to keep in close touch with these officials. In order to accomplish this important end district chiefs will visit the different provinces in their districts as often as possible. This is one of the most important means of securing the cooperation of the officials and of the people of the provinces, without which constabulary work can not be considered successful.

"Constabulary officers must not forget that they are civil employees of a bureau of the civil government and that by their conduct and action they must convince the law-abiding people of our interest in their welfare and our willingness to aid them at all times.

"Officers should be very particular to render proper courtesy to governors of provinces and to all local officials and to be on friendly terms with them, but they should keep their balance, and not take such undue interest in any one party as to damage their reputation for impartiality. As a detail bearing on this, officers should be advised of the impropriety of receiving presents of any value from officials and others.

"In an investigation recently it developed that an officer was in the habit of directing the president to come to his office. Such conduct is overbearing, discourteous, and intolerable.

"It is thought that all officers should subscribe to one of the representative newspapers published in English and one of the papers published in Spanish in Manila, so as to keep themselves posted on matters affecting public opinion. Officers who are stationed where they can not easily consult the copy in the senior inspector's office should subscribe to the Official Gazette (through the executive inspector) unless they are capable of reading the Spanish copy received by presidents and justices of the peace.

"Constabulary officers acting as inspectors of police, under section 12, act No. 175, should bear in mind that a small body with the various duties that municipal police have to perform depends as much for efficiency on the solid character of the members as on their capacity to drill. A great deal can be done by interesting presidents in the desirability of having good men. Sometimes a president not particularly in sympathy with the subject may have his interest aroused by others who may be induced to advise or counsel him.

"Officers should remember that those who are most successful in keeping in close touch with the people and in helping to allay local disagreements and smoothing over differences that would often give rise to local disturbances are fulfilling their highest and most important duties. They must be especially careful to avoid wholesale or public criticism of communities or individuals, and must learn the art of receiving information and impressions without criticizing others or making useless statements that injure the feelings of others. They may often render valuable service in arranging differences without the

necessity of telling their own views. Officers must learn to keep their personal views to themselves and to subordinate their private ideas to their public duties and responsibilities. Constabulary officers can be successful only by so acting as to convince Filipinos that they are their friends and not their enemies willing to injure or unjustly criticise them.

“The use of secret agents should receive most careful personal attention of the district chiefs. There is no doubt that the conduct of these agents has at times done great harm, and unless there is some specific act or crime to investigate, armed secret agents should be sent out only with the greatest care. Roving or general commissions should not, as a rule, be allowed. Most careful checks must be made on their behavior at all times to see that the harm they do does not outweigh the good.

[Letter of September 2, 1905.]

“For the purpose of emphasizing in the minds of all constabulary officials the paramount importance of their duties as political agents, it is necessary that the example be set by the highest officers of the bureau.

“The Secretary of War, the governor-general, and the secretary of commerce and police are convinced that, due to the changed conditions in the archipelago, our bureau should so modify its policy as to successfully meet them. Your experience has been ample to confirm their views.

“New conditions require, while maintaining cohesion and discipline in our ranks, that sound instruction in civic duties receive your first consideration.

“It is not meant that in any of the essentials of discipline, instruction, conduct, dress, etc., we should become less soldierly; but in the general dealings with provincial and other officials it is essential that the position of the constabulary as a loyal and actively interested element of the civil government be made clear and unmistakable. Where time is not too essential, the governor must be consulted about matters affecting his province, and every reasonable effort be made to meet his views or to arrange matters so as to leave no sense of injury or slight. The governors' position is such an honorable one that our officers must make them feel that we wish to aid them in their administration and that we have no desire to slight or pass over them. Attention is called to section 23 of act No. 175, as amended by act No. 610, as to the duties of senior inspectors in cooperation with provincial governors.

“Senior inspectors must be made to understand that their ability to get on with the provincial governors and other officials will in a great degree measure their success. Officers coming into the province must call on the governors promptly; similarly when going into a town they should call on the officials thereof.

“There is no intention of modifying by this letter my previous one of July 22, but rather to emphasize it and to mention some matters not taken up in that letter.

“If any of our officers feel disappointed that the military feature of the constabulary is made secondary, an explanation as to the higher nature of their duties as political agents and as to the greater responsibility they have should remove any such feelings. We must do all we can to help and to teach native officials by persuasion, advice, and explanation, and endeavor to secure and maintain their confidence and good will.

“The constant efforts of assistant chiefs should be directed toward cutting down paper work, and definite recommendations to that end are always welcome. All paper work that can possibly be dispensed with must be eliminated.”

“By direction of the chief of constabulary:

“ART. S. GUTHRIE, *Executive Inspector*.”

The satisfactory response that constabulary officers of all grades have made to these instructions is amply indicated by the commendatory remarks made by the various provincial governors in their annual reports.

The executive secretary in his annual report for this year makes the following statement in regard to the reports of the provincial governors:

“Indeed, one of the most encouraging features of these reports is the evidence they furnish of the harmonious relations existing between all of the authorities—insular, provincial, and municipal; witness the unstinted praise of the constabulary and the grateful acknowledgment of the value of its services made by every provincial governor who has alluded to the matter.”

Army officers detailed as inspectors for constabulary have, in connection with their other varied and important duties, been of the greatest value in the inculcation of the spirit of the above instructions.

In this connection, I believe it would be advantageous to all concerned to combine the duties of senior inspector with those of sheriff in each of the provinces. By doing this, and by giving one-half of the sheriff's present pay to the senior inspector, a marked saving would thereby be effected, and better services should be secured. In addition to the economy involved it would have a double importance in attracting better men to the constabulary and in identifying, yet more closely, senior inspectors with provincial officials, municipal officials, and the people.

SCOUTS.

At the present time there are no scout companies actually under the control of the governor-general; but a large number of the companies are stationed at points suggested by the insular government, and are ready to act at a moment's notice in accordance with a prearranged plan between the governor-general and the division commander. Their services under these conditions have been called upon at various times throughout the year, as stated, and their response has been prompt and effective.

On June 30, 1906, the Philippine Scouts occupied 40 posts throughout the islands.

AMERICAN TROOPS.

The use of American troops in Cavite Province in 1905 gave to the law-abiding people of that section more confidence in the strength of the American administration to protect them, and acted as a great quietus upon the lawless elements.

In the island of Leyte the prompt use of American troops, as reported, prevented wanton destruction and checked the further growth of the present outbreak there. Sixteen companies are operating against the pulahanes, with a detachment of constabulary accompanying each column when practicable. The harmonious operation of this measure advocated by General Lee has so far been highly satisfactory.

On June 30, 1905, there were in the Philippines five regiments of cavalry, nine of infantry, and three batteries of field artillery, with their quota of staff force, making a total of about 12,500, occupying 48 posts; on June 30, 1906, there were in the Philippines four regiments of cavalry, eleven of infantry, and five batteries of field artillery, making a total of about 14,500, occupying 32 posts. Because of the disturbance in Samar and Leyte the number of posts occupied by American troops had increased to 38 on July 31.

MUNICIPAL POLICE.

On June 30, 1903, there were in the municipal police force of the islands a total of 9,925 officers and men; this steadily decreased each year until on June 30, 1906, there were 22 captains, 61 lieutenants, 307 sergeants, 669 corporals, and 4,298 privates, a total of 5,357.

A considerable improvement has been noted in the average efficiency of this force. The relations of the constabulary officers to the municipal police as far as inspection, supervision, and instruction are concerned varies in different provinces. The tendency is to a fewer number in each municipality, and to men of higher grade. The defects of the municipal police noted in previous reports are less glaring than formerly. Constabulary officers have been instructed to impress upon municipal officials that the responsibility for the maintenance of public order rests with them, and that the constabulary is near them to assist only when it may be necessary.

Some slight amendment to the laws that would make the tenure of service of the police more stable would be beneficial and would not lessen the autonomy of the municipal government.

RELATIONS OF THE CONSTABULARY TO THE PEOPLE.

Due to the marked improvement in the officers of this bureau, a considerable improvement has taken place in the relations of the constabulary to the people of the islands. The value of the enlisted man is practically determined by the character and capacity of the officer. From his officer the

Filipino soldier learns how to comport himself toward the people among whom he may be stationed. From extensive inspections I am persuaded that the present satisfactory relations have never before existed. With the further advance in the standard of the officers and the continuous and persistent instructions given the men, it is believed that in the course of a year or two the government and the people may look with pride and satisfaction upon its insular police force. The limit to which the constabulary may be used in bringing in touch the remote mountain tribes, especially numerous in the fourth and fifth districts, will depend upon the funds allotted for constabulary uses. It is believed that no better system exists for the primary development of these people in their civic duties and in giving them some comprehension of the Government and of the outside world of which they are in dense ignorance. The organization of these semisavage and semicivilized people into barrios and the bringing of hostile rancherías into friendly relations with each other has been successfully accomplished during the past year in the third, fourth, and fifth districts, but what has been effected is but a differential of what remains to be done.

Throughout the provinces ex-constabulary and ex-scout soldiers are to be found performing civic duties as town councilors and as lieutenants and sergeants of police which without their service training they would never have been qualified to perform. When volunteers have been called for in the disaffected provinces a considerable number of these discharged men have responded.

FIREARM LICENSES.

There are now licensed in the islands 1,335 rifles, 749 shotguns, and 1,294 revolvers, a total of 3,378 firearms.

Under present law and instructions firearm permits entail an unnecessarily large clerical force, and are the source of annoyance to the executive bureau, the provincial governors, and the senior inspectors. Attention is invited to my recent recommendations in regard to this subject, with a view to simplifying the system and removing a needless source of friction. The following is from Colonel Harbord's report on this matter, and is in line with my recommendations referred to:

"It is now the most confused and inextricably mixed-up literature ever issued for the guidance of a police body. The responsibility divided between provincial governors and constabulary as to where permits shall originate is, like all divided responsibility, unsatisfactory. Either the one or the other would be better than the two. Senior inspectors and district directors should be allowed opportunity to remark on the propriety of issues of arms to municipal police instead of applications going at haphazard or direct to the chief of constabulary as is now done. Permits for arms it is believed should be issued for two years instead of one, which would lessen this very burdensome part of our clerical duties by half. As the responsibility for order in distant provinces lies with the constabulary therein, the question of permits for arms should be decided more on the opinion of the man on the ground, and influence with the authorities in Manila exerted directly should count less than at present."

CONCLUSION.

With the exception of the disaffection existing in Samar and Leyte and the Santa Iglesia movement previously referred to, there are at this moment no organized armed bands in the islands. Great strides have been made since the report of last year. The campaigns for seats in the approaching assembly promise to give rise to some minor perturbations.

The economic conditions are still unsatisfactory and must continue so until the people adjust themselves to changed conditions due to the loss of their work animals. This loss has had a more injurious effect upon the islands than has all the other serious calamities—war, cholera, smallpox, and locusts. Its influence upon public order is very marked even at this time.^a

Very respectfully,

HENRY T. ALLEN,
Brigadier-General, Director.

HON. W. CAMERON FORBES,
Secretary of Commerce and Police, Manila, P. I.

^aAn appendix showing strength report and station list by districts accompanies this report and is on file in the War Department.

APPENDIX 1.

REPORT OF DISTRICT DIRECTOR, FIRST DISTRICT, BUREAU OF CONSTABULARY.

HEADQUARTERS FIRST DISTRICT, BUREAU OF CONSTABULARY,
Manila, August 14, 1906.

SIR: I have the honor to submit the following report of operations and conditions in the first district for the year which ended June 30 last, with additional information covering the month of July:

The district comprises the provinces of Bataan, Batangas, Benguet, Bulacan, Cavite, La Laguna, Nueva Ecija, Nueva Vizcaya, Pampanga, Pangasinan, Rizal, Tarlac, and Zambales.

The provinces of Batangas, Cavite, La Laguna, and Rizal were detached from the district and formed into a provisional district under charge of Col. D. J. Baker, jr., assistant director, on January 30, 1905.

Col. D. J. Baker, jr., was appointed acting director of constabulary October 1, 1905, on the departure of the director on leave, and the provisional district placed under command of Capt. W. P. Baker, who had charge of it until it was abolished March 14, 1906, and the provinces comprising it again attached to the first district.

The greater part of the operations carried on under Colonel Baker's direction in the provisional district took place in the first half of the fiscal year ending June 30, 1905, and are therefore covered in the annual report which Colonel Baker made last year.

The undersigned took charge of this district October 16, 1905, relieving Col. W. S. Scott, assistant director.

On the departure of Col. D. J. Baker, jr., on leave of absence on March 24 last, the undersigned was appointed acting director of constabulary and performed the duties of that office in addition to those of assistant director in charge of the first district until relieved by the director June 21, 1906, the date of the latter's return from leave of absence.

The strength of the constabulary in the district has been gradually reduced during the fiscal year, the reduction coming into effect about December 1 last.

On June 30, 1905, the actual strength of the constabulary of the thirteen provinces now comprised in this district was 76 officers and 1,956 men. This does not include a considerable number of officers and men brought in for temporary service in the provisional district.

The actual strength of the thirteen provinces now in the district July 31, 1906, was 67 officers and 1,384 men. The large economy effected by this reduction will be increased during the fiscal year by a further reduction in rents recently made throughout the district.

The recent reduction in rents paid will amount to a saving during this fiscal year of about ₱6,600.

The failure of the Commission to appropriate funds sufficient to pay all of the 5,000 men now allowed the constabulary has necessitated a reduction in the enlisted strength of each company from 50 to 46. This reduces some of the companies, especially where there are but one or two in a province, rather too much, and it is thought that 50 men to a company is about the minimum number consistent with efficiency. It is hoped that the revenues may soon allow the Commission to add to the appropriation already given so that the companies can be maintained at 50 men each. We have now reached in this district the minimum limit of men under present conditions and any further reduction would be dangerous economy.

PRESENT PEACE CONDITIONS.

Conditions as to law and order throughout the district are at present very good, although considerable uneasiness still exists in some of the provinces on the railroad to the north of Manila, due to the spread last spring and summer of the "Santa Iglesia" movement under the leadership of Felipe Salvador referred to below. It is thought, however, that conditions in those provinces are rapidly improving, and that recent events have shown the poor, ignorant dupes of Salvador the folly of their ways. All ladrone movements attempt to cover up their purpose under the shadow of religious or political cloaks of some sort, and in this way the leaders are successful in influencing the ignorant people in the barrios.

There have been no religious conflicts during the year that resulted in breaches of the peace, and conditions in this regard have therefore shown an improvement also.

The Independent Filipino Catholic Church, commonly called the Aglipay faction, has a great many followers, especially in Pangasinan and Tarlac provinces. It has also a strong organization in many other towns in the district, especially in Rizal and Cavite.

LADRONE BANDS AT LARGE.

There are very few known ladrones at large in the district at present, probably fewer than at any time in the past. These comprise the remnant of Julian Montalan's band, which, under the leadership of Pablo de Castro, still infests the country on the Batangas and Cavite border. The band has about 10 rifles.

Felipe Salvador's followers must still have 20 guns, but many of these are scattered and now concealed, since the recent heavy losses incurred by the band near Hagonoy.

The following account of Salvador and his religious movement may be of interest:

The society of which Felipe Salvador is the head is called the "Santa Iglesia," or Holy Church Society. A great many of the country farmer people in the barrios of Bulacan, Pampanga, Nueva Ecija, Tarlac, and Pangasinan are undoubtedly members of or sympathizers with the "Santa Iglesia." The society purports to be a religious one, the members being given or sold crucifixes or rosaries by Salvador and using forms of worship similar to those in the Catholic Church. Salvador preaches socialistic doctrines to the believers, practices polygamy, and promises them that land and other desirable things will be distributed among his followers when he shall have overthrown the government and taken possession of the country himself; that there will soon be a great flood or fire that will destroy all unbelievers, and that after this purging of the country there will be a rain of gold and jewels for the faithful. He has a number of firearms, and one of his purposes is to attack police or constabulary detachments when practicable, in order to obtain more arms. When he desires to make a raid on a police detachment or a constabulary squad he has no trouble in augmenting his armed bodyguard with a number of bolo men and others armed with clubs. He states to his followers that the clubs will turn into guns if they are bravely used against government forces. Salvador's headquarters are on Mount Arayat, and he claims that occasionally his spirit takes flight for the purpose of visiting and interviewing the heavenly powers.

It is stated that the society was originally a revolutionary one started by one Cabino, a native of Apalit, Pampanga, who, upon his capture in 1893, is said to have been shot by the Spaniards in the plaza at Apalit.

Felipe Salvador, the present leader, appeared upon the scene in 1894 and reorganized the society, changing its name from "Gabonistas" to the "Santa Iglesia."

Salvador and some of his followers assisted in the attack by the Filipino revolutionary forces on the Spanish garrisons at Dagupan and Lingayen in 1898, and there Salvador secured about 100 rifles. This made him so powerful that the revolutionists took him into the forces of the Filipino insurrection through fear. Later Salvador was made by Aguinaldo a colonel in the revolutionary forces in 1899. When the forces of the insurrection in his province surrendered to the Americans, Salvador refused to recognize the surrender and became an outlaw. He had already lost most of his arms, and by deserting his post at Marilao on the approach of the Americans had been branded as a deserter by the insurgent leaders, who themselves attempted to capture him.

He was finally arrested by the constabulary in Pampanga in 1902, and convicted of sedition. He, however, escaped from jail and has been an outlaw ever since. Curiously enough, after his escape from jail his conviction was set aside by the supreme court for some reason.

Salvador is said to be the son of a Spanish friar. He treats the barrio people well, and it is said does not rob them of provisions, but prays with the people and asks them for contributions, which they usually give.

SPECIAL EVENTS.

The reduction in the force during the year has materially added to the already heavy task of the officers and men in the district in patrolling the outlying sections and in giving protection to life and property of the citizens. While a great deal of hard work has been performed by all, only some of the more special events of the year will be mentioned, as it is desired to make the report as brief as possible.

The principal events of the year were the killing of the noted desperado Cornelio Felizardo, who for ten years had terrorized by his unequaled brutality portions of Cavite and Batangas; the raid by Salvador's band on the constabulary barracks at Malolos in April, and the counter attack by the Bulacan constabulary, assisted by the constabulary of Pampanga, on Salvador's band near Hagonoy in July, in which 20 Salvadoristas were killed; and the surrender in the last four months of the ladrone leaders Macario Sakay, Julian Montalon, Lucio de Vega, Leon Villafuerte, Francisco Carréon, and Benito Natividad.

By the vigorous action of Colonel Baker and the constabulary and scouts under his command, and of the army forces that were operating with him in the provisional district last year, Felizardo's band had been gradually destroyed and his guns captured, and Felizardo was living quietly in one of the barrios of Bacoor where many of his old band lived awaiting an opportunity to secure fresh arms. Two soldiers of the Fourth Company of Rizal constabulary from the detachment stationed near Bacoor pretended to desert and join Felizardo, who received them and their arms gladly. Getting an opportunity a day or two later they killed him and brought in his body.

The attack of Salvador's band on Malolos, on April 16, was made for the purpose of getting arms in which it was completely successful, making off with 22 Springfield carbines and 1,800 rounds of ammunition, after killing 3 and wounding 10 of the 16 constabulary soldiers who were surprised in the cuartel. The attack was under the leadership of Manuel Garcia (since killed) and he had about 80 bolo men with him. Garcia and his band were vigorously pursued by the constabulary of Bulacan and Pampanga, and finally, with 53 men and 31 guns, on the 17th of June, Garcia crossed Manila Bay in a banca and landed in Bataan Province. He failed to receive much support from the people of Bataan and by the vigorous action of Captain Hall, inspector of constabulary, who was sent to temporarily take charge of the movement, and of the Bataan constabulary and the Second Company, Philippine Scouts, temporarily placed under command of the district director, the band was chased from place to place until they left Bataan, about July 7. Lieut. José de los Reyes, of the Bulacan constabulary, was operating against the band, with station at Hagonoy, and he soon had information of their movements when they tried to reenter the jurisdiction of that town. Lieutenant Reyes located the band and attacked them early on the morning of July 9 at the sitio of Balic-Balic, jurisdiction of Hagonoy, with 19 constabulary and 4 Hagonoy police, in a very swampy rice field with deep mud. The Santa Iglesias had fully 50 men, with 30 rifles, and evidently considered that they would have no trouble in capturing Reyes with his smaller detachment, as they called upon him once or twice to surrender. Reyes attacked gallantly and stood off the larger force until he was assisted, about 10 a. m., by 9 more policemen of Hagonoy and a little later by Lieutenants Walker and Bustos of the Pampanga constabulary with 20 men. A complete rout of the ladrones followed and in all 20 were killed, including the leader of the band, Manuel Garcia, alias Tui, who was also the leader in the raid on Malolos. A number of the band have since surrendered to the governor of Bulacan or to Major Orwig, of the constabulary there.

On July 18, 1906, "President" Macario Sakay of the so-called Filipino Republic, "Vice-President, Secretary of War, and Lieutenant-General" Francisco Carréon, "Lieutenant-General" Julian Montalan, and "Brigadier-Generals" Leon Villafuerte, Lucio de Vega, and Benito Natividad were incarcerated, after having unconditionally surrendered, one or two at a time. This, with the killing of Felizardo, has for the time being put an end to the extensively organized ladronism, of which the above mentioned were chiefs, that had for years infested the provinces immediately surrounding Manila. These leaders are still under confinement awaiting trial, their cases not yet having been called by the court of first instance.

The municipal police in the district are fairly efficient. Unfortunately the condition so prevalent throughout the islands under which the local officials are liable to use the municipal police as muchachos, or servants, prevails also in this district. Every effort is made to instruct the officials in this respect, and undoubtedly some are getting away from the old system which has the strength of long custom in its favor.

In many of the villages and barrios, however, the municipal police must be given credit for doing hard work on very small pay in the attempt to protect the people from carabao thieves. It is thought that a change in the law may be so made as to improve the municipal police without materially changing the policy of self-government on the part of municipalities, and further special report will be made on this subject.

While a municipality is allowed to make its own local ordinances, and while the presidente, as the executive of the municipality, enforces them through the local municipal police, it is believed that all this can still be allowed and done without giving the presidente and municipal council quite so much freedom to discharge and reengage policemen as they now have. The police will greatly improve in character with more permanency in the position.

The equipment of the constabulary in the district has been very satisfactory on the whole. The Springfield carbines, caliber .45, in use are worn out. As no new arms of this class are in existence, and as the machinery for making them in the arsenals in America has been replaced by more modern machinery, the time is near when the constabulary, in order to maintain its efficiency, must be rearmed. As new Krag carbines can be purchased of the Government at the low price of \$4 each, it would be in the interest of efficiency and economy to now rearm the constabulary with this weapon. It has been demonstrated time and again that it is almost suicidal for small detachments of government forces, armed with single-loading smoke-powder arms to face large bodies of fanatical bolo men.

The greatest improvement that has been made in the constabulary for several years was its reorganization into companies last fall, and the passage by the Commission, of act No. 1394 adding to the pay of officers and providing that those who qualify in a native dialect shall receive 10 per cent increase of pay for each five years' service.

The present organization of 50 men to a company works excellently, and the officers have taken much more interest in their men under the new conditions.

It is thought that the time has now come when the government should erect substantial constabulary offices and barracks—enough for 50 men in each provincial capital—and save much of the large amount now paid for rents. An excellent building is being put at Malolos, which will be finished in time for occupancy in a few weeks.

Constant efforts are made to reduce the amount paid for transportation of officers and men in the various provinces of the district. This consists in the hire of ponies, carromatas, carabao carts for the transportation of supplies, railway tickets, and the occasional hire of a launch for service on the lake or in the bay. It must be remembered, however, that mobility is one of the most efficient features of the constabulary, and that the more we reduce the force in a given province the more traveling around those that are left must do. A sailboat with auxiliary power is badly needed for patrol purposes in Manila Bay. A constant water patrol consisting of a discreet officer and a few dozen men should be kept in Manila Bay at all times.

Very respectfully,

H. H. BANDHOLTZ,
District Director.

The EXECUTIVE INSPECTOR,
Bureau of Constabulary, Manila, P. I.

NOTE.—The following tables accompany this report and are on file in the War Department:

Operations, showing arms and animals captured; expeditions, miles covered, number of encounters, killed, wounded, and captured, etc.

Number of municipal police and their equipment.

Operations by municipal police.

APPENDIX 2.

REPORT OF THE DISTRICT DIRECTOR, SECOND DISTRICT, BUREAU OF CONSTABULARY.

HEADQUARTERS SECOND DISTRICT, BUREAU OF CONSTABULARY,
Lucena, P. I., May 20, 1906.

SIR: Pursuant to memorandum of the acting director of constabulary, dated April 16, 1906, the undersigned has the honor to submit the following report covering a portion of the fiscal year ending June 30, 1906. Tabulation of work accomplished throughout the year, inspections, etc., of municipal police, as well as such additional matter as will bring this report down to the end of the fiscal year, and some photographs illustrative of constabulary work, will be submitted by Maj. Peter Borseth, who succeeds to the command of the district when the writer avails himself of a leave granted to take effect June 1, 1906.

From July 1 to October 21, 1905, the command of this district was exercised by Col. H. H. Bandholtz. On October 21, 1905, the undersigned assumed the duties of district chief, pursuant to General Orders, No. 79, Headquarters Philippines Constabulary, 1905. On April 8, 1906, Maj. Peter Borseth reported for duty as assistant district director.

PEACE CONDITIONS.

The district is at this time tranquil. Thirteen and one-third per cent of its authorized strength of 750 men are on duty in other districts. Two outlaw leaders are known to be at large, but they are committing no depredations, and are merely wanted for past crimes. One is Pantaleon Villafuerte, who belongs to Isabela Province, with a following of four men and as many old guns, who is a relic of the insurrection, and lives among the Negritos, back of Casiguran. His importance is due to the fact that he claims to be a part of the insurrectionists still unsubdued. Efforts are being made to get him by pressure on the Negritos and on his friends in Casiguran. The other outlaw is Juan Kabayo, who has no followers at present, and no guns so far as known. This man roams the region around Sogod Bay at the north end of the Tayabas-Ambos Camarines border. He will probably be picked up soon.

RELIGIOUS AND POLITICAL CONDITIONS.

There is nothing in any province of the district which at present threatens the peace.

In Albay, however, if the writer has correctly read the causes of previous disorders, the germs of trouble are not dead, but dormant. The people there are divided more than in any other province of the district into rich and very poor. The evils of caciquism are apparent there, and oppression of poor by rich Filipinos may again give trouble there in the future. Albay has suffered from insurrection, cholera, drought, reconcentration, and storm in the last few years, and such conditions breed discontent.

In Ambos Camarines the first general rice crop since the American occupation has been harvested. Everything promises peace and good order. Freight rates of the steamship companies running vessels to Nueva Caceres are quite prohibitive. It is said to cost the shipper more to transport a pound of freight from Manila to Nueva Caceres than from San Francisco to Manila. The quarantine at Manila, though now merely twenty-four hours, is made the excuse for an additional charge of 50 per cent on all freight shipped from Manila on lines to Caceres.

Mindoro, Sorsogon, and Tayabas give no indications of disorder. Sorsogon has suffered some from petty thieving near the capital, but the criminals have been captured and the depredations have ceased. This province is very badly in debt.

In Tayabas the conditions are excellent. The Catholic Church has seen fit to send to Sariaya for station eight Capuchin friars, much against the will of the people, who have made respectful representation of their wishes, thus far without disorder. This policy of the Roman Catholic authorities, if intended to drive a loyal community beyond the pale of their church, could not be more skillfully planned. That, thus far, the presence of these priests in a community

where the memory of former friars is execrated has resulted in no disorder, testifies that the people of Sariaya are law abiding.

American prestige in this district is injured by the presence of worthless specimens of our race—men without visible means of support other than that afforded perhaps by a “tienda” kept by a Filipino consort, but enough to prevent conviction for vagrancy. These men, by virtue of a white face and American birth, affect to patronize Filipinos of many times their intelligence and morality, and assume an attitude toward the government and people which neutralizes to some extent the best efforts of respectable Americans, official and unofficial, to bring the people into sympathy with the aims and ends of our country in this archipelago.

The municipal and provincial elections in all parts of the district passed off without disorder. They were all hotly contested, and many protests were filed, as may be expected where the right of suffrage is newly exercised. All the new governors are entering with zeal and intelligence on their duties and are cooperating with the constabulary to maintain order. It is believed that the ensuing two years will witness much material progress in this district.

SPECIAL EVENTS BY PROVINCES.

The principal crimes in Albay during the year have been the murder and robbery of a Chinese at Daraga on November 7, and assault on Rapu-Rapu November 28; the robbery at Bato, Catanduanes, on December 28; the bolong and robbery of a Spaniard at Ligao on January 18; and the setting fire to the municipal building at Tiui on April 17, during a hotly contested municipal election.

All the perpetrators of these crimes have been apprehended and brought to trial except the Tiui incendiary, whose early apprehension is hoped for. The band of Ciriaco Sacro, the only organized one in the province a year ago, has been put out of business. A number have been killed, some captured, and the remainder, including Sacro himself, surrendered to the senior inspector in March. The living ones have been duly sentenced.

Ambos Camarines has suffered but little during the year. Two men of the Kabayo outfit near the Tayabas border were captured in September. A member of the Sacro band from Albay, named Pedro Nas, was killed by Negritos in November and a rifle turned in to the constabulary. Rumors occasionally circulate of the presence in the Ragay mountains of Valerio Avila, supposed to have been killed over a year ago, but nothing authentic has been obtained though several expeditions have been made to investigate. In March a small band of thieves were dispersed by constabulary near Cababanga, the leader being killed and two others wounded.

In Mindoro a badly wanted ladrone was captured in September. In February Licerio Francisco, captured by Inspector Schwebel in November, escaped from the provincial jail and was killed by constabulary near Sablayan. This man had broken jail twice under Spanish rule and twice since the American occupation and had been a ladrone for fifteen years.

In Sorsogon some petty crime has occurred but no organized bands have operated during the year. Emissaries from Samar have occasionally crossed over for recruits. The principal one, a lieutenant named Maximo Romero, was killed near Cataingan, Masbate, in November. One of the creditable events has been the apprehension of the looters of the “Cantabria” wreck, the principal one going to Bilibid for four years and being sentenced to pay ₱10,000 fine. This man's son is the secretary of the bishop of this diocese, and the conviction was secured in spite of considerable influence being exerted in behalf of the accused. In April several robberies were committed in towns along Sorsogon Bay, but the perpetrators were apprehended by constabulary.

Several unimportant robberies and an occasional murder have occurred during the year in Tayabas. An extensive band of carabao thieves, operating between Tayabas and La Laguna provinces, was rounded up in January and February, and some thirteen were confined in Tayabas. Several important people in La Laguna were implicated and much pressure was brought to bear from there to secure low bail, and later to get the trial held in that province. The first of these efforts succeeded, and it is understood that the latter also, though with what effect on the fate of men undoubtedly guilty can not now be said.

SCOUT COMPANIES.

All scout companies on duty under the insular government in this district, when the undersigned succeeded to his duties, were relieved in November. Their service was satisfactory but uneventful.

ARMS, EQUIPMENT, UNIFORM, AND SUBSISTENCE.

The Springfield carbine should be at once replaced with the United States magazine carbine, now abandoned by the United States Army for the new Springfield. The manufacture of the old Springfield and its spare parts has ceased, and within a very short time the constabulary will be practically disarmed through the unserviceable condition of its carbines. They are now worthless for shooting purposes. The need of a magazine carbine has been time and again demonstrated in contact with bolomen. In addition to the carbine the constabulary men should carry a short machete or bolo of good steel. It gives him a confidence in closing to hand-to-hand conflict that a gun never will, and is of inestimable value in making him comfortable in bivouac. The revolver might as well be called in. Few Americans can shoot well with it, and no Filipinos that the writer has seen. The allowance for target practice with the carbine ought to be greatly increased. It now practically amounts to nothing. Thirty rounds a year will not impart nor maintain skill in shooting.

The uniform leaves little to be desired. The legging is more expensive, less comfortable and less durable than woolen puttees such as are used in the fifth district, and should be replaced by them throughout the constabulary. The hemp-soled sandal is very useful, but being open gathers sticks, mud, and gravel to such an extent as to almost prohibit its use under certain conditions. The hemp sole soaked in tar, with a canvas upper, ankle high, with bellows tongue, and heel slightly stiffened, makes an admirable marching shoe, and has been used by the writer with great satisfaction in all kinds of weather over all kinds of country. A model of this shoe was furnished the chief supply officer in 1905, with suggestions for a trial.

The monogram "P. C.," still a part of our uniform, has now no significance. If the distinctive insignia is to be a monogram, "B. C." would be more appropriate, but is susceptible to so many interpretations, particularly one as to the antiquity of the organization, that it is objectionable. The coat of arms of the Philippine Islands without the crest and scroll, properly enameled in colors, would make an admirable and appropriate insignia for a collar ornament for both officers and men.

The subsistence of the constabulary is satisfactory. The ration is flexible and sufficient, and the system is excellent.

MEDICAL ORGANIZATION.

The medical organization is satisfactory. The only drawback is the lack of personnel.

BUILDINGS.

Only one building occupied by constabulary is owned by the insular government in this district—that is the former Guardia Civil building at Nueva Caceres, now used as barracks, which is satisfactory and in good condition. Special attention has been given to the reduction of our rent rolls in all parts of the district, and with considerable success.

The need of an appropriate district building, and the saving in rents consequent thereon, have been submitted to the acting chief supply officer, with recommendation to the acting director that it be located at Albay for reasons given hereafter.

Recommendation has been made that the ₱18,000 for barracks allotted this district be used at Albay, with enough added to construct the district building, which will include barracks for a company of Albay constabulary.

TRANSPORTATION.

Wagon and pack transportation can be used to some extent in all provinces of the district except Mindoro. There are good roads in Tayabas, Ambos Camarines, and Albay. In Tayabas and Sorsogon, water transportation for the senior inspector is a necessity. Tayabas, for constabulary purposes, includes the island of Marinduque, Tablas, Sibuyan, Romblon, and some smaller ones; Sorsogon includes Masbate, Burias, and Ticao. Each of these senior

inspectors should be provided with a sailboat large enough to hold 25 men in an emergency, and provided with auxiliary gasoline engine. This matter has been made the subject of a letter to the chief supply officer with request that it be included in the estimate for the coming year.

RELATIONS WITH FILIPINOS.

Particular care has been taken to bring all officers into line with the policy outlined in General Orders, No. 66, and Circular 33, Headquarters Philippines Constabulary, 1905, of cultivating friendly relations, social and official, with the Filipino people, and thus securing their sympathy and cooperation, without which our work can only be poor and incomplete. The purpose of the instructions referred to has been carefully and repeatedly explained by the district director to all officers, and has been made the subject of inquiry and admonition on every visit of inspection he has made. It has also been his custom to lose no opportunity to inquire of Filipino officials of all grades as to the conduct of constabulary detachments, including officers. Provincial governors and municipal presidents, whenever available, have been invited to accompany the director in his inspections of detachments. It is believed that they responded to this courtesy with increased interest in the constabulary, with a new feeling of ownership in it as citizens, and that a friendship for it is growing. Hostile criticism seems to be disarmed and the effect on officers and men is also good. Only one or two officers have failed to see the dawning light and they have been eliminated.

INSTRUCTION OF CONSTABULARY.

People who charge the constabulary with militarism fail to recognize that the best police forces of the world are disciplined and instructed by military methods, and that by use of such means we simply avail ourselves of the accumulated experience of many generations. In a country where the individual intelligence is highly developed, and education is general, there may, without much deterioration, be some relaxation. For example, the machine-like precision of the goose step and other like exercises dear to the heart of the foreign martinet, find no place in the instruction of the American soldier. The modern open-order fighting, which depends so much on the individual soldier and his intelligence, originated in America. With our constabulary men, however, we can not at this time depend on much individual initiative. We can not afford to neglect anything which tends to engender the habit of obedience, discipline, and respect for law, orders, and the rights of others. Nor is it wise not to avail ourselves in our organization of the respect for things military in appearance and name which has been instilled in the Filipino by three centuries of Spanish rule. The constabulary "captain" or "lieutenant" carries far more weight in a Filipino community than the "senior inspector" or "inspector." Every effort has been made therefore to exact from our officers the deportment, carriage, and dress which the Filipino expects from men wearing the honorable titles borne by constabulary officers. The instruction of the men has been in conformity with this. Particular attention has been given to neatness of dress, soldierly bearing, and accuracy in drill exercises. The results have been satisfactory.

Target practice has been held throughout the district at 50, 100, 200, and 300 yards, permission of the acting director being had to substitute 50 and 100 yards for 500, as required by the target order of last year. No man can shoot well at 500 yards without instruction at lower ranges, and the occasions on which our men will fire at malefactors farther away than 200 yards will be extremely rare. The allowance of 30 rounds per man is entirely inadequate to impart any skill. This, with the worn rifling of the carbines, has made the target practice very unsatisfactory. The instruction has, however, been faithfully given.

Considerable attention has been given to athletic instruction. The first officer bringing his company to much proficiency in this instruction was Lieut. H. R. Talbott, of the First Company, Ambos Camarines, and with a selected squad he has since spread the work in other provinces. It consists of tumbling, wall scaling, swinging ring and springboard work, and exercises on horizontal and parallel bars. Great proficiency has been developed in many companies, and a fine spirit of competition and rivalry has been created. It has led to athletic apparatus being erected by Filipino citizens in nearly every town where constabulary are stationed, and in one province has been imitated in the public

schools. The officer named, with a squad, has, on recommendation of the writer, been sent to impart this instruction at the constabulary school. The Filipino soldier takes great interest in this work, and his physical improvement is bound to follow.

Companies have also been required to provide themselves with fire apparatus, consisting of bamboo ladders, hooks, and buckets made of oil cans, and fire drills are held. During the dry season this will without doubt save more than one nipa town.

Bands have been formed in the constabulary of Tayabas and Sorsogon, the men playing in addition to their other duties. Two more are being organized in the constabulary of Albay and of Ambos Camarines. No easier way can be devised of making the men contented and happy and of popularizing the organization than by organizing these bands. The instruments are bought from mess savings. Practically every Filipino plays musical instruments, or can easily learn. At the present stage of affairs a band is more useful in keeping the peace in this district than the same number of merely armed men, provided, of course, that the band is instructed in constabulary duties, and when occasion arises can lay aside cornet and cymbals for the carbine. It would be a great help to our influence in the provinces if the constabulary band, which ought to signify, if names mean anything, a band for constabulary, could be divorced from the capital city long enough to make an occasional visit to the several districts.

Instruction in English to average three hours per week has been faithfully carried out. Since the end of the school year, through the courtesy of the director of education, night school for constabulary has been carried on at all stations where an American teacher has been available.

SUMMARY OF RECOMMENDATIONS.

A magazine arm should be secured for the constabulary at once. The allowance of ammunition for target practice should be greatly increased. A machete or bolo should be supplied to all constabulary.

The "P. C." monogram should be replaced by an appropriate insignia. For leggings woolen puttees should be substituted.

Sailboats with gasoline auxiliary power should be provided for the constabulary of Tayabas and that of Sorsogon.

The orders and regulations on firearms permits should receive a thorough revision. It is now the most confused and inextricable mixed-up literature ever issued for the guidance of a police body. The responsibility, divided between provincial governors and constabulary as to where permits shall originate, is, like all divided responsibility, unsatisfactory. Either the one or the other would be better than the two. Senior inspectors and district directors should be allowed opportunity to remark on the propriety of issues of arms to municipal police, instead of the applications going at haphazard or direct to the chief of constabulary, as is done now. Permits for arms, it is believed, should be issued for two years instead of one, which would lessen this very burdensome part of our clerical duties by half. As the responsibility for order in distant provinces lies with the constabulary therein, the question of permits for arms should be decided more on the opinion of the man on the ground, and influence with authorities in Manila exerted directly should count less than it now does.

The unfavorable location of Lucena, with no port, as a site for district headquarters has already been brought to the attention of the acting director. The town of Albay is a much better location, the average distance to all points in the district being shorter. The increased efficiency through greater ease and consequent frequency of inspections will alone justify the change. While peace now reigns in all parts of the district, it is the opinion of the writer that Albay will be much closer to any future trouble than Lucena. A suitable district building, including barracks for one company and offices for the province constabulary, should be provided there in the ensuing fiscal year, and headquarters of this district taken there as soon as it is completed.

Generally the undersigned has had cheerful obedience and hearty cooperation from all his subordinates. No just cause for complaint against constabulary has been given any person in this district this year so far as known, and none has been received.

Very respectfully,

J. G. HARBORD,
District Director.

THE EXECUTIVE INSPECTOR.
Bureau of Constabulary, Manila, P. I.

**REPORT OF THE DISTRICT DIRECTOR, SECOND DISTRICT, BUREAU OF
CONSTABULARY.**

HEADQUARTERS SECOND DISTRICT, BUREAU OF CONSTABULARY,

Lucena, P. I., August 7, 1906.

SIR: With reference to memorandum of the acting director of constabulary, dated Manila, April 16, 1906, Col. J. G. Harbord, as district director, rendered an annual report for the fiscal year covering period up to May 20, 1906.

PEACE CONDITIONS.

The district is at this time tranquil. Thirteen and one-third per cent of its authorized strength of 750 men are on duty in other districts. Two outlaw leaders are known to be at large, one is Pantaleon Villafuerte, who is the leader of a band of nine or ten men armed with 4 Krag rifles, 1 Mauser rifle, and 1 Colt revolver, with some ammunition. This man with his band committed a robbery at Palanan on June 24 of this year. In this robbery ten houses were searched and a little over a thousand pesos taken, in Mexican currency, with articles of clothing, food-stuffs, etc. The other outlaw is Juan Cabayo, who roams the region around Sogod Bay at the north, and between the Camarines and Tayabas border.

RELIGIOUS AND POLITICAL CONDITIONS.

There is nothing in any province or district which at present threatens the peace, and the undersigned has nothing to add under this paragraph to what has already been stated in the report rendered by Colonel Harbord.

SPECIAL EVENTS BY PROVINCES.

Since the report rendered by Colonel Harbord on May 20, there has nothing of importance occurred throughout the district.

SCOUT COMPANIES.

Since taking command of the district there have been no scout companies under the insular government in this district.

ARMS, EQUIPMENT, UNIFORMS, AND SUBSISTENCE OF CONSTABULARY.

The undersigned has nothing to add, and concurs in the remarks made by Colonel Harbord in his report of May 20.

MEDICAL ORGANIZATION.

The medical organization is satisfactory. The drawback in the lack of personnel has been remedied by the assignment of two additional medical officers to the district, which I believe is sufficient for all purposes. A hospital was established in Sorsogon under the direction of a medical officer, under date of June 20, 1906.

BUILDINGS.

Have nothing to add to the report rendered by Colonel Harbord on May 20, and concur in the recommendations therein.

TRANSPORTATION.

Land transportation has considerably improved within the last two months, and as a whole is very satisfactory.

INSTRUCTION OF CONSTABULARY.

Have nothing to add to the report rendered by Colonel Harbord in his report of May 20, 1906.

RECOMMENDATIONS AND CONCLUSION.

Colonel Harbord in his report of May 20 says:

"A magazine arm should be secured for the constabulary at once. The allowance of ammunition for target practice should be greatly increased. A machete or bolo should be supplied to all constabulary."

This recommendation in my mind is of such value and importance for a high efficiency of the constabulary that it should be given special and immediate attention. The Springfield carbine has not proven a satisfactory arm for constabulary.

Tables showing number of carbines, rifles, shotguns, revolvers, captured, etc., expeditions, etc., police efficiency in the district, and photographs of second district constabulary, are herewith inclosed.

Very respectfully,

PETER BORSETH,
District Director.

The EXECUTIVE INSPECTOR,
Bureau of Constabulary, Manila, P. I.

NOTE.—The following tables accompany this report and are on file in the War Department:

Police, strength, arms, and condition.

Arms and ammunition captured, expeditions, enlisted men, and prisoners.

APPENDIX 3.

REPORT OF THE DISTRICT DIRECTOR, THIRD DISTRICT, BUREAU OF CONSTABULARY.

HEADQUARTERS THIRD DISTRICT, BUREAU OF CONSTABULARY,
Iloilo, June 30, 1906.

SIR: In compliance with the memorandum of the acting director, of April 16, 1906, I have the honor to submit report for the third district, bureau of constabulary, for the year ending June 30, 1906.

The district corresponds to the Department of the Visayas of the Army and comprises the provinces of Samar, Leyte, Bohol, Cebu, Oriental Negros, Occidental Negros, Antique, Capiz, and Iloilo.

All provinces may be said to be peaceful in general, as the existing lawless elements in every province are confined to a small area. They do not roam from one end to the other, nor change their field of operations. That is one notable feature of the Visayan outlaw—he does not go far from the haunts he has known from childhood.

BOHOL.

The province of Bohol, ever peaceful, is without constabulary or other armed force than the municipal police who have revolvers. This was not intentional, however, but it having so come about no force has been provided because none was available and conditions were not such as to demand sacrifices elsewhere. When the constabulary was reduced in numbers in the fall of 1905, a company of scouts on duty with the civil government was ordered to Bohol to relieve the constabulary which was to be disbanded. About this time the scout company was returned to duty with the military, it being understood by my superiors and myself that it would continue to garrison Bohol. The company was in Bohol, however, only a few days when it was ordered away by the military authorities and the island was left without a force. The people of Bohol are poor and ignorant. In several instances differences have arisen between the people and the municipal authorities over the collection of taxes. In one instance the constabulary was called for, but the officer found the people were not well informed and thought themselves being abused by local authorities. On another occasion the people, hearing of the suspension of the land tax, refused to pay even their delinquencies. They were agitated by trouble makers and a number were imprisoned by the governor, charged with sedition. They are a people who pay willingly their church dues, but anything except indirect taxation by the government leads them to seditious thoughts, if not actions, against municipal authorities as ignorant as themselves and lacking wholly in ideas of just administration,

There are no organized outlaw bands in Bohol, and no arms known to be in possession of persons unauthorized to have them.

The people are faithful to the Roman Catholic Church and take little interest in higher politics. If left alone and unagitated they will always be peaceful.

There are 33 municipalities, each provided with 5 revolvers for the police. Permits have been issued to individuals, covering 61 revolvers, 9 shotguns, and 3 rifles.

The roads of Bohol are good, but there are no harbors. There is a telegraphic station at Tagbilaran, connecting with Cebu. Telephone lines run along the west and south coasts.

The provincial jail guard is armed with 11 Remington rifles.

ANTIQUE.

In the province of Antique nothing has occurred to jeopardize the general peace. In the northern part of the province one Bitoc, a montesco of some notoriety and several murders, has asked to be allowed to surrender and live unmolested by the authorities. He has 1 rifle and a revolver or two.

The people take little interest in higher politics and are contented. The independent Filipino Church predominates. There is no more strife between sects. Protestantism is being established.

In September, 1905, Lieutenant Guild encountered above Culasi, the montesco chief "Pasio," who offered resistance, resulting in the death of one of his men, and the wounding of Corporal Masa of the constabulary, by rifle ball. "Pasio" has since surrendered his rifle to the presidente of Culasi, and no more trouble is looked for in that section.

The municipal police of Antique are armed with 3 Remington shotguns and 92 revolvers (Colt). Licensing of arms to private individuals has been slow, but to date over 75 permits have been issued.

The roads of the province are bad, and some of the rivers are, during the rainy season, impassable for days.

The provincial jail guard is armed with Winchester repeating shotguns.

The constabulary was reduced this year from 130 men to 100, organized into two companies. The force actually on duty is 72 men and 2 officers, stationed at San José, Valderrama, Culasi, and Bacalan. Twenty-five men are from the First Company, Capiz. One entire company is on detached service in Leyte. The presence of the constabulary is desired by provincial and municipal authorities and relations are cordial.

CAPIZ.

The province of Capiz continues quiet and peaceful. There are no recognized bands of outlaws, but the custom of the people living in the mountain districts along the southern border is to recognize the predominance of certain old outlaw chieftains, who are now evasive, yet committing no depredations. Their people, however, are often accused by Iloilo people of petty thieving. It is believed there are many guns in these mountain sections, but, if so, they are never used to commit depredations.

Patricio Dias and Terio Aguilar are the two principal chieftains and are reported to control 8 Remington rifles, 1 Remington carbine, 4 Mauser rifles, 6 muzzle-loading shot guns, and 1 revolver. I think these men and their arms could be secured by the local authorities of Capiz. I know of no specific offenses with which they could be charged.

Religious and political questions do not disturb the province. The independent Filipino church and the Protestants are gaining a foothold.

The principal event of the year was the exposure of the border town of Tapaz as a medium for animals, stolen from Iloilo, to find their way to purchasers in Capiz. The theft of carabaos in the northern part of Iloilo has materially decreased since Tapaz methods were brought to light, and hacenderos have expressed themselves as feeling more secure in their property. There have been no serious breaches of peace during the year.

The municipal police of the province are armed with 116 revolvers, 51 Remington rifles, 5 Murata rifles, and 2 Mauser rifles.

There are in possession of individuals under regular permit 178 revolvers, 41 shotguns, and 26 rifles.

The roads of the province are bad to impassable during the rainy season.

The provincial jail is under the control of the senior inspector of constabulary and guarded by constabulary.

A recent epidemic of surra carried off many horses, and the constabulary has now but one chino and one native pony.

The constabulary was reduced from 165 to 100 during the year, and there are at present actually on duty in the province 55 men and 3 officers, stationed at Capiz, Tapaz, and Dao. One platoon is on duty in Antique. One officer and 12 men of the Dao company are stationed in Lemery (Concepcion district), Iloilo Province, in order to wipe out the provincial line, stop complaints, and improve the service. This places the Concepcion district of Iloilo under the care of the senior inspector of Capiz. Owing to the general reduction of force, the Calivo section of the province was abandoned and detachments sent elsewhere. This caused the governor some uneasiness, as, owing to the extreme ignorance and superstition of the people in the headwaters of the Calivo River, he thought a force should be handy to that section.

If the appropriation will permit, I desire to place the Dao company in a post in the mountains to the east of that town, and begin a process of assimilation on those people who want no kind of government other than that of the survival of the fittest. These mountain posts cost a little more to supply, but they have proven so successful as civilizers and preventives of trouble that I would like to establish more of them.

NEGROS.

The island of Negros is divided into two provinces, but the constabulary is administered as a unit under the senior inspector at Bacolod, Occidental Negros.

Negros has been more quiet and peaceful during the year past than at any time during the American occupation. The only outlaw band of importance is that under the leadership of Eugenio Alcachupas, who assumed command upon the death of "Papa Isio." With Alcachupas there are Marcelo Tuyó and Angel Mayo. They have seven rifles. The band has committed no depredations during the year. It lives off the mountain people about the volcano Canlaon, and south, to San José, and by contributions from hacenderos, who prefer to pay tribute to giving information. Grotesque uniforms and caps are worn, and much time given to praying and practicing religious ceremonies.

In April a sergeant of constabulary with 10 men struck the band near Canlaon, killed one, and captured one carbine and the revolver of Alcachupas, and (it is reported) wounded Marcelo Tuyó through the shoulder. Angel Mayo was formerly an officer of Papa Isio, and surrendered in 1902 to the military. He was used as a guide for a long while by both the military and the constabulary, and then tried his hand at honest toil on several haciendas. He became tired of this last year and joined the "Babaylanes" again.

Captain Smith killed "General" Bito last February in the same locality where Papa Isio was killed. "Bito" was a general of Alcachupas, and commanded several sweet-potato patches and wore shoulder straps. A few days previously he had dropped down to the barrio of Libertad, without knowing there was a constabulary patrol near, and barely escaped capture.

Religious and political strife is very keen on this island, and is particularly bitter in Oriental Negros. It is unfortunate that the election of the provincial governor, and most of the presidentes, is dependent purely upon religious instead of political questions.

The independent church element predominates.

The municipal police of the island are armed with 136 revolvers, 115 Remington shotguns, and 53 Remington rifles.

Permits to possess firearms have been issued to individuals to cover 624 revolvers, 187 shotguns, and 208 rifles.

The roads of the province are fair during the dry season, and there are several rivers navigable for large canoes. There are no harbors on the north and west coast of Negros.

The provincial jail guard is armed with shotguns.

The constabulary of the island consists of four companies, with a strength of 186 men stationed at Bacolod, Guimbalaon, Camp Barrett (on the government farm), Camp Clark (6 miles east of Isabela), Hacienda Canalaon (on the slope of the volcano), Valle Hermosa, and Dumagueta. If the appropriation will permit, I desire to transfer the Valle Hermosa post to a point on the east slope of the volcano Canlaon, as it is the hill people who must be watched and dominated.

CEBU.

In the province of Cebu, the scheme of grouping the mountain people into barrios, under the protection and guidance of the constabulary, has been more extensively practiced than in any other province. Maj. Harvey P. Neville and Lieut. Mateo Luga have been very conscientious in their work, and are responsible for bringing back to civilization several thousand people who formerly, as adherents of the outlaw chieftains, were a menace to the peace of the province. I quote an extract from Major Nevill's interesting report:

"The present peace conditions of the province are very good, considering what they have been in the past, there being to-day probably fewer organized 'pulahanes' within its borders than ever before in its history; however, this condition should not be considered permanent, for a great number of the disturbing element are still at large, and on the first opportunity they will be back in their old haunts plying their trade as before.

"The disturbed zone might be defined by a line drawn from Cebu to Balam-ban on the north, and from Naga to Pinamungajan on the south. Those sections of the province to the north and south of these lines are entirely pacified and if reasonable watchfulness is maintained no organized trouble should occur therein, particularly is this so of the southern half of the province.

"By stating that the northern and southern portions of the province are pacified, I do not mean to say that the pulahanes from the disturbed zone will not or can not enter these sections on temporary expeditions or raids. Should there be anything of this nature to occur, the point of attack would most probably lie outside of the disturbed zone. However, there are at present no organized bands permanently located in the sections referred to as pacified.

"During the year pulahanism has been almost entirely suppressed in the section between Camp Walker and Camp Barry, Cebu and Danao. A large territory to the south and west of Camp Walker has likewise been cleared of this element.

"Within the disturbed zone the sections now demanding the greatest attention are those adjacent to Minglanilla, Toledo, and Cebu. One of the greatest difficulties to be overcome in the pacification of this section is the cohesion and bond of sympathy that exists between all the mountain people, whether pulahanes or farmers. A party of pulahanes can always depend on finding aid and comfort in almost anyone of the multitude of barrios skirting these several towns. If too closely pressed, the bands break up into parties of two or three members each, go into one of the several barrios and there remain until the pursuit is abandoned. Rarely have parties following these tactics been exposed; never has exposure been made from any barrio of Cebu, Minglanilla, Talisay, or Toledo. Much of the trouble experienced along these lines will disappear under the administration of the present governor.

"The question naturally presents itself of how to permanently maintain law and order in the middle interior section of this province. In answer thereto, I respectfully recommend some action along the following lines: This province has a population of something like 650,000 people; many sections, particularly the south, are overpopulated and the land is very poor, giving little return for the labor of cultivation. In what has been described as the disturbed zone are found thousand upon thousands of acres of the most fertile land. This land was formerly cultivated by the pulahan element, but is now idle and must necessarily remain so, unless we can populate it with a more pacific people than the former occupants. It is believed that it would be profitable and advantageous to the government to undertake the colonization of this waste land with people drawn from those overpopulated sections of the south. The most inviting section now in view is the Mananga River Valley.

"The question then arises as to how to govern these people after they have been thus colonized, or one might ask, the country being populated before, and it being impossible to govern it, why should we expect success now?

"My answer would be that our failure before was due to two causes:

"1. The unsettled and warlike condition in which the country found itself immediately following the insurrection.

"2. The inadequacy of the present form of municipal government when applied to mountain sections inhabited by a warlike people.

"The conditions immediately following the insurrection have materially improved and are rapidly passing away, and it is now time that we consider such changes as would remedy the second fault. My recommendation would be a complete change of the present system of government by taking the mountain

sections from under the several municipalities and establishing in lieu thereof a form of 'township government,' as prescribed in acts No. 1397 and No. 1398. Beginning at Carmen and Asturias on the north, running south to Naga and Toledo, there is not one municipality that pretends to govern the people living over 7 miles from the coast line. Once the tao established himself beyond this approximate line he was out of touch with all form of government; if he happened to be of an aggressive or strong character he soon organized his own little band. If his nature was such that he was content to follow the lead of others, he settled in a locality already ruled by some chieftain and became a member of the clan. A government that would change this must be of such a nature as to be in close touch with the people; kind and judicious, but having the power to strike hard should the necessity arise. The needs of the people must be constantly considered, and such revenues as might be collected from them should be expended for their good and not for that of the coast people. Such government would of course require the financial support of the insular and provincial governments."

Governor Osmeña, although confined to his bed the greater portion of the time, brought considerable pressure to bear upon the municipal authorities of the towns on the outskirts of the disturbed section. With the municipalities united against the outlaws, and the people of the mountains controlled by the constabulary, there was little left for the leaders to do but surrender or move elsewhere. Accordingly, on June 24, Quintin Tabal sent in three Krag rifles and one Springfield carbine to the governor. After a personal conference he agreed to return to the mountains and do what he could to bring in his brother Anatolio (Adoy) and the balance of their guns. The depredations of the outlaw bands during the year were the sacking of the town of Minglanilla in July, in which 16 men, women, and children were murdered, and the attack March 7 on the scout post of Mount Biga, which resulted in the death of an American hospital corps man and the wounding of two scouts.

On November 30 Lieut. Charles Pendleton, while under the influence of liquor, about midnight, shot and killed a municipal policeman of Cebu. He had several constabulary soldiers with him and used one of their guns. He was tried by an American judge and defended by an American lawyer. On January 22 he was found guilty of homicide and sentenced to twenty years' imprisonment and to pay a fine of \$3,000. He took an appeal to the supreme court. Lieutenant Pendleton bore a reputation for being courteous and gentlemanly. He was unfortunately given to periodical drinking spells, and it was during one of these, following a Thanksgiving celebration, that the deed for which he was sentenced was committed.

The municipal police of the province are armed with 61 Remington rifles and 165 revolvers.

Permits have been granted private parties to cover 270 revolvers, 61 shotguns, and 6 rifles.

All the roads are along the seashore, with the exception of one now under construction between Cebu and Toledo. There are no navigable rivers.

The provincial jail is a substantial structure, and the guards are armed with shotguns.

The constabulary consists of four companies (186 men), with stations at Camp Barry (in the mountain, 8 miles west of Danao), Camp Walker (12 miles northwest of Cebu, and at an altitude of 3,900 feet), at Cebu.

Two companies are at present on detached service in Leyte.

Three companies of scouts (300 men) occupy Maga, Sambuluan, Biga, Toledo, Balamban, and Tuburan. This force is not under the civil government and does not operate. Its presence, however, is important as a preventive measure. It is much easier to prevent uprisings than it is to put them down.

LEYTE.

The province of Leyte, owing to its proximity to the notorious province of Samar, is generally considered to be menaced by the outlaws of that island. Nothing, however, is further from the truth. At this writing Leyte occupies the stage as the most disturbed province, owing to the recent uprising against the municipal police and authorities of the interior town of Barauan. False impressions have been given out from time to time of the real conditions on this island by declarations of peacefulness and tranquillity. A more expressive term would be to say it was quiet, for, although peaceful on the surface, the smoldering embers of pulahanism have never lost the guard, who at different times

during the past four years has fanned them into flame. This guard is Faustino Ablen ("Papa Faustino"), and his domain is the mountains of Ormoc, Albuer, and Barauan. The followers of the Tamayos about Jaro are another menace to the peace of the province, although this element is more revolutionary in its intentions. Other sections of the province are without disturbing factors. Juan Tamayo was killed by Presidente Astorga, of Zumarraga, Samar, on July 9, 1905. This outlaw was a revolutionist, a pulaban, and a ladrone. He never raided with a large band, but was continually agitating the people. He was killed while recruiting in Samar.

Thereupon his brother, Felipe, assumed command. Felipe came into Jaro in June and surrendered to Lieutenant Jackson, presenting two revolvers, although he had been informed his surrender would not be accepted unless he presented all his arms. The governor gave him a pass to go out and endeavor to bring in the remainder of his guns. I do not think he will do it.

The section between Barauen and Ormoc has always been what may be called the disturbed zone. The detachment of constabulary formerly stationed in Burauen was withdrawn because no officer was available to command. During the latter part of the year the constabulary of Leyte was reduced from 225 to 150, with the intention of relieving the Dolores company with scouts and placing it in Burauen. The scouts were not furnished and the Burauen section was left to the police. With the Tamayos in, the only outlaw chieftains remaining are Faustino Ablen and his new pupil "Ydos." They have, including the 14 rifles captured from the police of Burauen, 20 rifles, several revolvers, home-made shotguns, lantacas, etc. Faustino's practice is to intrench himself far back in the mountains and obstruct all trails with pitfalls, planted spears, etc.

This province is strongly Catholic, the Aglipayano, or independent, church having made little or no headway in establishing itself.

The municipal police of the province are armed with 205 rifles and 120 revolvers. There are about seventy licensed firearms in the hands of individuals.

The roads of the province are poor to impassable during the rainy season. There are no navigable rivers.

The constabulary consists of three companies (140 men), stationed at Tacloban, Tunga, and Dolores. There are at present attached to the province two companies from Cebu, one from Antique, and one from the second district.

It is extremely hard to obtain good men for the service, and some men have been recruited in Cebu.

ILOILO.

The province of Iloilo improves from year to year. The only actual or threatened disturbances are by thieves. The outlaws here are very different from those in other provinces, and the principal sufferers from their depredations are the outlying barrios. Lack of sufficient force only prevents the establishment of several posts in the heart of the mountains to break up entirely these bands. The province requires little attention by the district director, as the constabulary, the governor, and the people work in accord.

The independent church elements rule the province, but there exists no bitter feelings between denominations. Several Protestant institutions have been established and are making headway in the interior.

The recognized outlaws now in the mountains are: "Oto," Sano (brother of Oto), Alejandro (son of Sano), 27 firearms; Toribio Alegorio (son-in-law of Sano), his son Pedro, and Ayaton Macheter, 7 firearms; A D or E D or Edi, his sons, Gabino and Clemente, 12 firearms. Of all these outlaws, Agaton is the most active. The rest remain in the mountains, tilling the soil and avoiding the influence of municipal law or any branch of the insular government.

On March 24, Melchor Madera, an old outlaw, but not one of the worst type, surrendered to Captain Lewis, with 5 rifles and 2 shotguns.

On April 2 the two most desperate and villainous thieves in the province, "Taleon" and "Alva," were taken, through strategy, by Captain Beazley. Both have been sentenced to hang.

The municipal police are armed with 203 rifles, 173 revolvers, and 7 shotguns. It is the most efficient force in the district. Permits have been granted individuals for firearms covering 444 revolvers, 248 shotguns, and 115 rifles.

The province has many good roads and bridges, but no navigable rivers.

The constabulary consists of four companies stationed at Jaro, Leon, Tubungan, Camp Sison, Maasin, Janiway, and Lambunao. One company of the general service is stationed in Cabatuan and Alimodian, but it will be withdrawn for duty elsewhere as soon as it is recruited to full strength.

SAMAR.

The pulahan trouble on Samar is not confined to the southern section of the province. Constant patrolling by armed forces of the government and constant vigilance by the municipal authorities is, however, necessary to prevent secret preparations for another outbreak. I quote from the report of Capt. Ralph W. Jones, senior inspector:

"The present peace conditions in the province of Samar, with the exception of the interior districts occupied by fanatics or pulahans, are very good. The people living in the coast towns are law abiding, and no wise in sympathy with the pulahan movement.

"The outlaw organizations still at large are the religious fanatics under the leadership of Pablo Bulan, alias Papa Pablo, Pedro de la Cruz, and Isidro Pompac, alias Otoy. Their followers are the remnants of the old Dios Dios bands, later known as 'Cazadores,' and a large number of criminals who fled from justice in the coast towns, also a number of ignorant people who prefer the life in the mountains to living in civilized communities.

"Papa Pablo is the religious head of all the outlaws in Samar. Pedro de la Cruz is 'jefe superior de operaciones' (superior chief of operations), and Isidro Pompac is 'segundo jefe de operaciones' (second chief of operations).

"Papa Pablo and Pedro de la Cruz are said to be in hiding with a small number of men in the mountainous district to the north and east of Catbalogan, in the jurisdictions of Gandara, Catbalogan, and Wright. They have in their possession, or under their immediate control, 20 Springfield carbines and 2 revolvers. They are accompanied by Lorenzo Galleno, a comandante (major) of notoriety in the Gandara country. They are very quiet; in fact, so much so that continuous efforts on the part of the constabulary have failed to discover their hiding place or elicit any definite information relative to their whereabouts or intentions.

"Isidro Pompac, with a considerable following, occupies the interior mountain regions south of the Ulat River, between Taft, Borongan, and Llorente, on the east coast, and Balangiga, Basay, Calbiga, and Wright on the west coast. Nasario Aguilar, Cipriano Amongo, alias Tiduceduc, José Jerna, and Vicente Picardal are his principal known associates and subordinates, and are notorious for their treachery and outlawry. There are a number of other subordinates of more or less notoriety, but whose names are not available. In this region there are from 20 to 25 firearms.

"The entire force is mobilized only for depredations, and at other times is divided into small detachments, each commanded by a comandante, and occupying an allotted district to the interior of outlying barrios of the above-named pueblos, on which they levy for supplies and funds, although they grow an abundance of good sweet potatoes in all the mountain clearings.

"In the northwestern part of Samar, near Matuguinao, on the headwaters of the north fork of the Gandara River, there is still at large a remnant of a band of pulahanes, who left their homes in Poponton in April of the current year. So far as is known, they are at present without a common leader.

"Peace conditions in the province are only effected by the religious fanatics, otherwise known as pulahanes, and reported on above.

"Catholicism is the predominant, in fact the only, religion in the island. Missionaries and Aglipayanos have not as yet made their appearance.

"On July 25, 1905, the constabulary engaged the pulahanes at the sitio of Mongbong, jurisdiction of the Magtaon Valley. The results were the dissolution of the pulahan band for the time. Apparently no further attempt was made to mobilize the pulahan forces in the Magtaon section until March of the present year. About two hundred men, women, and children, who had abandoned their homes at San Mauricio, Majancao, and Beri, barrio of Calbiga, and had joined the pulahanes, surrendered to the constabulary, and, in accordance with the policy of the government, were allowed to return to their homes.

"On August 16, 1905, a column of constabulary, under the command of First Lieut. George A. Helfert, with Second Lieut. Juan Sulse, surprised the camp of Chief Antonio Añugar, a noted pulahan leader of the Gandara Valley. Antonio and a number of his companions were killed. Five Springfield carbines and 1 revolver were captured. Lieutenant Sulse was the prime factor in working up the information which led to the location of the pulahan camp.

"The result of the death of Añugar was to rid the province of the most dangerous agitator in the entire pulahan movement. Nearly all of his immediate followers surrendered shortly afterwards.

"No further encounters with the pulahanes were had during the year 1905. It was known that pulahanes were in various parts of the Magtaon Valley and adjacent mountain fastnesses, but no information as to exact whereabouts could be secured. On January 1, 1906, a small detachment of constabulary was stationed at Magtaon, on the request of the provincial governor, Hon. George Curry, to relieve a company of scouts. The governor began the formation of a settlement at this point. In the early part of March the governor went to Magtaon to further the work of the settlement, and learning of the presence of a band of pulahanes that had mobilized near by, made offers of terms if they would surrender.

"After several weeks of negotiation, during which time the camp of the pulahanes was visited by Governor Curry, and the pulahan officers visited the settlement at Magtaon, an understanding was arrived at by which the pulahanes were to surrender March 24, 1906. Instead of surrendering, as agreed, the pulahanes, commanded by Nasario Aguilar, made a treacherous attack on the constabulary garrison on the day and hour appointed for the surrender."

I quote my report on the now famous fight at Magtaon:

"After several weeks of negotiating by Governor Curry, during which time the camp of the pulahanes was visited by him and the pulahan officers visited the village and constabulary camp at Magtaon, an understanding was arrived at by which the pulahanes were to surrender. March 24 was the day set for the presentation.

"At about 10 a. m. on that date a band of pulahanes, led by Aguilar, numbering some one hundred and thirty men, with about 15 rifles and carbines, marched into the station and halted in line, facing the cuartel of the constabulary, and at a distance of about 40 yards.

"Governor Curry, Judge Lobinger, Superintendent of Schools Hoover, Mr. Scott, Mr. Campbell, and Captain Jones were directly in the rear of the pulahan line, as were also the pulahan chiefs.

"The constabulary, numbering 50 men, with Lieutenant Bowers and Subinspector Puño, were in the cuartel.

"As the pulahanes marched up, Captain Jones, watching them closely, observed something in their manner which made him suspicious and he leisurely made his way to the cuartel. As he reached it he heard the signal to attack given by Aguilar.

"The pulahanes fired a volley and with drawn bolos and spears rushed forward, closing in on the center. The rush was so unexpected and made with such impetuosity that the constabulary had scarcely time to fire one volley. The fight then was hand to hand. Some of the constabulary were swept aside by the overwhelming force against them. Some 14 became separated from the command.

"Captain Jones, Lieutenant Bowers, and Subinspector Puño stood their ground and by their superb courage and example held their force together and beat off the pulahanes.

"After the first rush the fighting continued fiercely, and when the last of the pulahanes disappeared there remained but 7 enlisted men of the constabulary able to fight. Seven more were lying about more or less seriously wounded and 22 were dead. Captain Jones received a bad spear thrust in the chest early in the fight, but fought on, regardless. Lieutenant Bowers received a gunshot wound through the left arm, which, however, did not put him out of the fight.

"Of these who became separated 4 were found to be wounded.

"Thirty-five dead pulahanes were found on the field and 8 more have since been found some distance off. The number of wounded who escaped can not be determined.

"A number of the rifles and carbines of the pulahanes were captured by the constabulary, but the net loss of the latter was 15 carbines. This loss could not have been avoided, as the number of pulahanes was so overwhelming that a man was always ready to make off with the gun of each constabulary as he fell.

"The unarmed Americans present with Governor Curry escaped to the river and afterwards rejoined Captain Jones who armed them.

"The little band, determined to make good the victory, immediately intrenched and began the work of burying the dead and caring for the wounded. Reinforcements arrived the next day, during the afternoon, with Doctor Gilchrist, Mr. Lamb, and Mr. Wilber.

"Lieutenant Harn and Doctor Soll of the constabulary arrived soon after and are deserving of high praise in caring for and transporting the wounded.

"Major Johnson of the scouts is deserving of commendation for excellent judgment shown in ordering Lieutenant Flecher to proceed at once to Magtaon in case he failed to receive word of the expected surrender within a certain time.

"Upon the arrival of Lieutenant Flecher he promptly proceeded in conjunction with the constabulary reinforcements to follow the pulahanes. The sincere cooperation and hard work of this officer merit special mention.

"The alertness of Captain Jones in observing the first signs of treachery by the pulahanes and his subsequent brave stand is, in my opinion, gathered from eyewitnesses, the only reason why the attack did not result in a massacre of the entire force of constabulary and the unarmed Americans as well. It is recommended that he be awarded a medal for valor and advanced ten files in his grade.

"The conduct of Lieutenant Bowers and Subinspector Puño, in rallying their men and standing up to the fight in such a courageous manner, merits the award of a medal for valor and promotion to the next higher grade. It is so recommended.

"The following list constitutes those who were left alive on the field and who by their loyalty and faithfulness to their officers and their Government, with the aid of those who fell, saved the day and won honors for the constabulary. It is recommended that each be awarded a medal for valor.

"Third Company, Samar: Private Victor Macariola.

"Fourth Company, Samar: First-class Privates Faustino Llorando, wounded; Juan Ababo, wounded; Ramos Babo, Florencio Cuello, Honorio Cipriano, Clemente Fumar, Eustaquio Lopinac, Juan Nofes, Tomas Dizon, wounded.

"Third Company, Constabulary school: Sergeant Basilio Villas, wounded; Corporal Alberto Barbosa, wounded; Privates Anacleto Cumanan, wounded; Dionicio Castro, wounded."

I inclose some testimonials from some of the Americans present.

Medals for valor were awarded as recommended. In the fight at Mongbong Captain Jones received three severe stabs. His loss was 6 soldiers and 2 cargadores dead, 5 soldiers and 2 cargadores wounded, and 6 carbines lost. He counted 30 pulahanes dead on the field.

At this writing our force in Samar consists of 5 companies of Samar, 2 general service, third district, and one constabulary school, a total of 370 men. They occupy Cathalogan, San José, Lope de Vega, Hinabangan, and Biri.

The last-named post is nearer the center of the pulahan country. There should be another post of 2 companies farther to the southeast.

There are no roads in the island. The government is constructing a trail across the province which will aid greatly in its control. Several rivers are navigable for light craft.

REMARKS.

The work of the constabulary has been greatly hampered by the reduction in force and the shortage of officers. There are several mountain districts inhabited by a class who would require very little to incite them by raiding and plundering. Garrisons should be established among these people, and they should be required to recognize existing laws and conditions. We have done what we could along this line with the force at our disposal, but outbreaks like Burauen will continue to occur so long as we do not dominate these partially civilized mountain people. The feeling which exists between mountain and town people breaks into open warfare only too readily, due to the efforts of municipal officials to enforce compliance with their authority, and to the presence among the mountain people of a few strong characters, or their friendliness to some outlaw leader who is ever ready to join any move against municipal authority. My experience in Samar, Leyte, Cebu, and Panay is that when the mountain people can be brought under the influence and the protection of a post of constabulary, the would-be leaders of pulahanism and ladronism can not muster sufficient force to do any particular damage, and gradually the desire for peace and prosperity becomes paramount. In Samar, Leyte, and Cebu, mountain barrios have been formed, schools and churches built, and the acreage of cereals and vegetables increased to a wonderful degree; all by the constabulary on its own initiative and supported only by the good will of the people. Our curtailed strength prevents the extension of this work.

MUNICIPAL POLICE.

The consensus of opinion among governors and constabulary officers is to make the municipal police more of a provincial police. I am not in accord with this idea because it removes the responsibility from the municipal officers to the governor, and in that event the support of the officials and people of the town would be lacking. There should be provided, however, an inspector or supervisor of municipal police who should have no other duty and no accountability.

The question may be asked, Why do not the officers of constabulary perform this duty? Is it not so prescribed? To do anything well, attention must be given it to the exclusion of all else, and in provinces where it is important that the police are efficient, it will be found that constabulary officers have more than they can attend to in handling their own forces. The principal difficulty is that, because of poor pay or more often no pay, the members of the police force are not by any means of the character necessary for the service. I would recommend some of the conditions to be imposed upon municipalities which are granted rifles be: That the council provide by enactment that the pay of each policeman shall be not less than 15 pesos; that the pay of the police shall be given priority over all other salaries or obligations; and that payment shall be made regularly at the end of each month. Failure to comply with this obligation should be followed by immediate recall of the arms. Do this one thing, and I believe a great improvement will be noticed in the police.

EQUIPMENT.

The present arm, the Springfield carbine, is fast wearing out. The more modern and serviceable carbine, the Krag, should be furnished for at least those provinces in which severe fighting occurs. A bayonet should be provided. Greater success would have followed the scouts and constabulary on Samar had they been armed with the magazine gun. Even pulahanes respect the "rapidos."

Considerable attention has been given to target practice this year, and the results were quite pleasing. Both officers and men are encouraged to work harder in the preliminary exercises. It is recommended that the allowance of ammunition be increased to 100 rounds for carbines and 200 rounds to officers for pistol practice. The range should not exceed 100 yards. If our officers and men can become proficient marksmen with both carbine and pistol, much effective work can be done with smaller detachments, and the prestige of the constabulary would rise to make its presence of more moment to the lawlessly inclined. Confidence in one's self makes a man brave.

Aside from the arms, the equipment of the constabulary is highly appropriate and satisfactory.

In the uniform it is earnestly recommended that the khaki shirt be substituted for the blue one. It is suggested that the money value of clothing not drawn in kind be refunded to the Government and not paid to a man upon his discharge. The reasons usually advanced in support of the army method are not, in my opinion, based on good grounds nor the result of investigation. This would result in a saving of a good many thousand pesos which could be used to better purpose. The amount would support several more companies which we so sorely need.

SUBSISTENCE.

In the effort to curtail paper work I think the subsistence regulations have been made oversimple and too much reliance is placed in the efficiency of young men unaccustomed to responsibility. The allowance is ample and a marked decrease in sickness is noted since the subsistence was authorized. It is recommended that wood be purchased from mess funds and not from public civil funds.

MEDICAL DIVISION.

It is with considerable regret I learn consideration is given the suggestion to transfer this division from the constabulary. Just at the time when the division is well organized and performing excellent service are our officers and men to be deprived of the aid which the sick and wounded so sorely need and so greatly appreciate. In no other bureau do officers and men risk so much, and to be deprived of prompt and efficient medical aid would be a blow indeed. Every company in the army and every scout company has its surgeon. The

constabulary of this district has three surgeons for 27 companies. An example for the necessity for a constabulary surgeon is to be found in the recent Burauen raid. Seven policemen were badly wounded. A constabulary surgeon was sent from Iloilo to Burauen, a three days' journey (one day being by steamer). One week thereafter the provincial medical officer arrived from Tacloban (two-days' journey), being carried the last day in a chair because of his ponderous weight, making walking or riding a physical impossibility. Constabulary surgeons must be available to go with expeditions and must therefore be subject to the orders of the bureau.

The army hospitals are not good substitutes, because natives are not acceptable patients and do not receive the same conscientious treatment which a constabulary surgeon would give them. The undersigned owes his life to the fact that there was a constabulary surgeon near the zone of operations in Samar in May of last year.

Veneral diseases are becoming entirely too common. The government is placed at an expense for treatment while the soldier lies up in hospital, saving his clothing allowance, and enforcing additional work on his companions. Twenty-three per cent of the diseases treated in the Iloilo hospital were of this class. It is recommended that when a member of the constabulary is incapacitated to perform full duty by reason of sickness not incurred in line of duty he forfeit all pay and allowances during the period of such incapacity, and be required to pay for treatment received and medicines furnished.

BUILDINGS.

A permanent post is to be constructed on the outskirts of Catbalogan, Samar. Plans are drawn, and the contract has been let.

There are ten posts in the district which are located in barrios or mountain districts. In these the buildings are of nipa, and the maximum cost of men's barracks and officers' quarters is about ₱800 for a post. Some of these buildings have been erected by contributions of labor, material, and money, and by soldier labor. One post in Cebu large enough for two companies has stood for two years at a total cost of ₱75 to the government.

It is desired to construct six such posts during the coming year in interior sections.

The next permanent post to be constructed will be on the outskirts of Cebu.

TRANSPORTATION.

This district is furnished with two coast-guard launches, and ample work is found for both. A small launch is hired for river work in Samar.

Cebu, Leyte, and Iloilo are furnished with wagons.

Transportation is the most important item of expense to an organization which is expected to spread itself over great areas and, like a drop of oil in the ocean, keep the seas from breaking. If a force is to be kept small in number, the deficiency should be made up by a corresponding increase in mobility. Cut down a police or military force in both numbers and mobility, and there is left nothing but a guard sufficient only to protect the ground upon which it stands, deprived of means to do the work required of it. Thousands of dollars have been spent in pacifying Samar, and thousands will be spent to bring Leyte to a condition of peace. A sufficient force of constabulary with ample allowance for transportation would have cost much less.

WALLACE C. TAYLOR.

Assistant Director of Constabulary.

The EXECUTIVE INSPECTOR,

Bureau of Constabulary, Manila, P. I.

SUPPLEMENTARY REPORT COVERING MONTH OF JULY, 1906.

ILOILO, July 31, 1906.

SIR: In compliance with letter of the 19th instant, I have the honor to render the following report covering occurrences in the third district, July 1 to 31, inclusive.

The following is a copy of my report of July 28:

"I have the honor to render the following report on the recent pulahan uprising in Leyte, stating briefly the operations in connection therewith.

"Shortly before daylight on June 19, a large force of pulahanes armed with 5 or 6 rifles and under the leadership of Felipe Ydos, attacked the municipal police station in the pueblo of Burauen, Leyte. The attack was a complete surprise, and resulted in the death of 5 and wounding of 7 policemen, and the capture of 14 of the 15 rifles with which they were armed.

"The pulahanes made no attempt to rob or molest the people of the town, their principal object being to destroy the municipal records, secure the arms of the police and wreak vengeance upon that organization. After remaining in the town about two hours the band retired to the mountains.

"Upon the receipt in Tacloban of information of this raid, Lieut. L. E. Jackson of the constabulary proceeded with all haste to Burauen with a force of 12 men. Two companies of Cebu constabulary, under Major Nevill, arrived in Burauen on June 23. Two companies of constabulary were ordered from Samar to Leyte, one going to Tunga and the other to Ormoc.

"An expedition from Burauen during the last week in June found no trace of the pulahanes. On July 5, Major Nevill with one Cebu company attacked a strongly entrenched position at Mantagara, about one and one-half days west from Burauen, with a loss of 7 men, severely wounded by falling into pitfalls filled with spears. The position was considered too strong to attempt further assault without a larger force, and operations were suspended pending reinforcement.

"On July 11, the pulahanes abandoned their stronghold in Mantagara, upon the approach of the reinforced column of constabulary. Operations continued in the mountains until the 16th, when the constabulary returned to Burauen.

"On the morning of July 17, a force of pulahanes was reported in the barrio Patock, between Dagami and Pastrana, presumed to be the main body under Felipe Ydos. This body was followed by Captain Beazley from Dagami, but the trail was lost after two days. At the same time another force of pulahanes was reported near and to the west of Burauen. Lieutenant Williams pursued this latter band and came upon their rear about five and one-half hours due west from Burauen, killing one and capturing a considerable quantity of rice and other supplies. This band, which was afterwards learned to have been people from the lowlands who were going to the mountains to join the pulahanes, numbered more than a hundred.

"Major Nevill reported the people within the zone of operations to be very much excited and represented the conditions as being serious.

"On the morning of July 21, information was received at Burauen of a small party of pulahanes a short distance to the northwest. Lieutenant Williams, with Lieutenant Worswick, American Scout McBride, and 34 men of the Second Company of Cebu, went in pursuit of this band and attacked them about 2 miles west of the road between Burauen and Dagami. Instead of being a small party of pulahanes, this band proved to number several hundred, the larger portion of which swung around and rushed the constabulary from the flank. At the same time a rush was made from the front. The constabulary was overwhelmed and an effort was made by Lieutenant Williams to effect a rally; in this he was partially successful. The pulahanes forced the constabulary back, killing Lieutenant Worswick, American Scout McBride, and 12 enlisted men, and capturing their arms. Lieutenant Williams, with 14 men which he had rallied, were unable to get into Burauen, as the pulahanes blocked the way. He therefore headed for Dagami, where he obtained reinforcements and returned at once to the field. Eight enlisted men who were unable to join Lieutenant Williams's rally made their way into Burauen.

"It is quite evident that the constabulary, on this occasion, made a strong fight, as several dead pulahanes were found about the bodies of each of the Americans and some of the enlisted men.

"The band of pulahanes passed close to Burauen and proceeded to the barrio of San Victor, to the north of Tabontabon, where they stayed that night.

"As conditions continued to grow worse, the military had been called upon to aid the civil authorities, and on the morning of the day following the fight just described one platoon of Captain McMaster's company of the Twenty-fourth Infantry under his command arrived in Burauen; the other, under command of Lieutenant Silcox, arrived in Tabontabon.

"The people of Burauen rendered Major Nevill every assistance, and the morning of the 22d information was received that the pulahanes had spent the previous night in San Victor. At 6 p. m. Major Nevill, with 50 constabulary, and Captain McMaster, with his entire company, arrived in Tabontabon where

information was obtained that the pulahanes were reported to have left the barrio San Vicente, to the southeast of Tabontabon, with the intention of attacking Burauen. Major Nevill and Captain McMaster returned immediately to Burauen in hopes of heading them off, arriving there at 3 o'clock the following morning. This movement caused the pulahanes to go in the direction of Dulag. A detachment of the Twenty-fourth Infantry from Tacloban arrived in Dulag in time to deter the pulahanes from attacking that place and they proceeded in the direction of Tolosa, being reported about 3 miles out of that town on the night of the 23d. Captain Jones, with a small detachment of constabulary and a detachment of the Twenty-fourth Infantry was sent out that night from Tacloban and arrived in Tolosa in time to prevent an attack there.

"Information being received by Major Nevill and Captain McMaster in Burauen that the pulahanes were near Tolosa, they left at 7.30 the morning of the 24th for Tabontabon.

"This column consisted of Major Nevill, Lieutenant Jeancon, Lieutenant Williams, and Subinspector Yasay with 50 constabulary, and Captain McMaster with 26 men of Company E, Twenty-fourth Infantry. Felipe Tamayo, the outlaw who recently surrendered, was in charge of a detachment of bolomen, acting as scouts and spies.

"Upon arrival at the river near Tabontabon, Tamayo reported the presence of pulahanes in that barrio, and Captain McMaster, who was in the advance, pushed ahead with 6 of his men and 4 constabulary, Major Nevill and the main column closing up as rapidly as possible. After crossing the river, Major Nevill observed that the pulahanes were breaking from in front of Captain McMaster and doubling back on both flanks. He thereupon rallied the main body. The rally was scarcely completed when the two flanking columns of pulahanes united in the rear and charged in a body. The action was severe, the pulahanes making three distinct charges; however, they were unable to withstand the fire, although some fell dead within a few feet of the rally.

"All this time Captain McMaster with his small detachment was about 25 yards distant, fighting off the pulahanes and endeavoring to fall back on the main body. His little party was at one time in a critical situation, it being necessary to use clubbed guns.

"The engagement lasted about one-half hour, and at its close 40 dead pulahanes were found on the field; five or six wounded were found in the brush near by; six dead pulahanes have been found since the action, and reports are continually coming in of many more wounded presenting themselves in various towns.

"Two Springfield carbines, 1 Winchester shotgun, and 2 old guns were captured from the pulahanes. The casualties in the Government forces were 1 first sergeant of constabulary wounded in the leg, 3 enlisted constabulary killed, and 3 carbines lost.

"The 3 constabulary who were killed were in charge of cargadores and, finding themselves unable to join the rally, endeavored to return to Burauen and were killed on the way.

"The good judgment, ability, and gallantry displayed by Maj. Harvey P. Nevill in promptly preparing for and resisting this attack are worthy of the highest commendation. If the awarding of the medal for valor is not to be confined to cases of individual acts of bravery or reckless daring it is recommended that an award be made to Major Nevill in this instance in recognition of the masterful manner in which he conducted the action, which in itself necessitated the display of valor to an unusual degree.

"The bold dash of Captain McMaster of E Company of the Twenty-fourth Infantry and the stand made with only ten men, was a heroic exhibition of superb courage. The broken gunstocks, and the pulahan dead, who lay on all sides, were grim evidence of the desperate, determined fight made by this intrepid officer. He is deserving of the highest recognition possible for gallant soldiers to receive.

"The junior officers of the constabulary, the enlisted men of the Twenty-fourth Infantry, and the enlisted men of the constabulary are highly commended by their commanding officers."

In connection with the above I quote the following report of Capt. George H. McMaster, Twenty-fourth Infantry, to the War Department:

"I have the honor to submit the following report of an engagement at Tabontabon, which occurred on the 24th instant.

"Under instructions from the department commander my troops cooperated with the Philippines constabulary under Maj. H. P. Nevill.

"The column consisting of Major Nevill, 50 constabulary, and myself, with 26 enlisted men Company E, Twenty-fourth Infantry, and one hospital corps private, left Burauen at 7.45 a. m. for Tabontabon, it appearing probable from the notices received from Major Nevill that the pulahanes would be in this neighborhood, as the forces thrown into Tolosa and Dulag by Colonel Borden, Twenty-fourth Infantry, had prevented them from entering these towns.

"Column on road was disposed as follows: Some 25 voluntarios preceded the column, then in single file 4 constabulary scouts, followed immediately by Company E, 1 sergeant, and 3 selected privates followed by three squads. Then came the constabulary, followed by cargadores, with 3 constabulary privates in rear.

"At 11.30 a. m., before crossing the little stream to the south of Tabontabon, the voluntarios halted and sent back word that pulahanes were seen in town across stream. Not desiring to give them time to make disposition, I immediately started off the column, slowing up slightly across the stream to allow column to close up, and soon observed pulahanes, decorated in red, in the street of the town, from 200 to 300 yards beyond the stream.

"The point opened fire, and I rushed 4 constabulary and some 6 soldiers to the first cross street in town. At the first street to the right the rear end of a column of pulahanes appeared, moving toward the stream; magazine fire was immediately opened upon them.

"Soon pulahanes appeared, passing around the front of my detachment in order to cross the stream to the left. The advance party would fire upon these as they crossed the street to the front and left.

"While a little way down the street to the left, the first sergeant of constabulary was shot in the leg, while another member of the advance party broke the stock of his rifle in striking a pulahan. I moved this advance guard into the interior of the block to the left front of the original position at the intersection of the cross street.

"As shots from the main column began striking in the neighborhood of this detachment I made them seek cover, and as the firing from the main column became very heavy I moved the detachment back toward where the advance guard opened fire originally. Major Nevill took advantage of a slight rise between the stream and the town and formed the troops in a circle, in single rank, kneeling elbow to elbow. He was none too soon, for the column whose rear the advance guard had fired into had crossed the stream by parallel form and fell upon this circle just as Lieutenant Williams's company of constabulary was closing the circle.

"Three separate rushes were made upon this circle, the pulahanes showing fanatical bravery, the dead lying in every direction, a number being within 25 yards. As the advance guard drew near the circle a party attempted to charge it from the left, but the magazine fire soon made them swerve into a ravine near the stream.

"By noon the pulahanes had all withdrawn; they numbered 500 and lost probably, in killed and wounded, from 100 to 150. The actual count, after a limited search of the thick brush, was 49 killed and 3 wounded, the latter being carefully looked after.

"Passing through this town on the 25th instant, the teniente reported that up to that time he had buried 55, one of them being Mariano Narja, the chief second in command. Two Springfield carabines, 2 belts with Springfield ammunition, 1 belt with Winchester shotgun ammunition, and 2 crude guns were taken.

"Our casualties were first sergeant Cebu, constabulary, left lower leg gunshot wound slight, and 3 privates, constabulary, with the cargadores, who were either killed in fight or murdered afterwards, they losing 3 Springfield carabines. In two cases of hand to hand conflict, in one stroke in both cases, the woodwork of the Krag rifles were smashed, in one case the barrel being badly bent. This is mentioned as an illustration of the tendency of the American soldier to use the rifle as he was trained in youth to use the baseball bat.

"This suggests the question as to the wisdom of making a soldier carry a bayonet recommended in tropical countries because of its bolo features, recommended formerly because of its entrenching-tool features, and recommended recently, and it is thought erroneously, because of its Japanese features. Whereas it is respectfully represented that thrusting features alone should be considered and this permits length and lightness, as shown by the old fluted bayonet.

"For service in these islands this little engagement and the operations preceding it and following seems to indicate that the regulars and constabulary each supplies to the other what the other lacks, and no one who saw the cool and masterful action of Major Nevill in this engagement, and who knew how he has been managing a very difficult situation, but will congratulate the Philippine constabulary upon possessing such an officer."

The action at Tabontabon scattered the pulahanes and served to cause them to abandon further effort to bring on an engagement with the government forces. At this writing, however, bands of pulahanes are reported in several directions.

In the province of Cebu the two outlaws, Quintin and Anatalio Tabal (Aday), kept faith with Governor Osmeña, and on July 13 surrendered three Krag rifles, one Mauser, and one Springfield carbine. This completed the presentation of all firearms known to be out in Cebu. There being many minor outlaw leaders yet out, the governor informed Quintin and Aday that they must return to the mountains and either cause the surrender or capture of every one of these. To this they agreed and were informed that they (Quintin and Aday) would be tried before the courts as soon as the work in hand was finished, although it could not long be delayed. I believe with the governor that these men are sincere and have fully made up their minds to place themselves at the mercy of the government through the constituted courts.

In bringing about the surrender of the outlaws of Cebu, Governor Osmeña has shown himself to be a man of strong character and determination. He believes in the constabulary and the constabulary believes in him. The cooperation has been most cordial. Cebu may now be said to be peaceful, and vigilance only is necessary to forestall any movement toward pulahanism.

During July but little has occurred in other provinces of the district and conditions remain good.

WALLACE C. TAYLOR,
Assistant Director of Constabulary.

The EXECUTIVE INSPECTOR,
Bureau of Constabulary, Manila, P. I.

NOTE.—Accompanying this report are numerous tables showing number of arms captured, animals recovered, patrols, expeditions and engagements, miles covered, constabulary and outlaws killed and wounded, etc., in the provinces of Antique, Capiz, Cebu, Iloilo, Negros Occidental, Negros Oriental, Leyte, and Samar. Also municipal police, officers, men, arms, and their condition and number of arrests, and chronology of events in the various provinces.

APPENDIX 4.

REPORT OF THE DISTRICT DIRECTOR, FOURTH DISTRICT, BUREAU OF CONSTABULARY.

HEADQUARTERS FOURTH DISTRICT, BUREAU OF CONSTABULARY,
Vigan, Ilocos Sur, P. I., July 1, 1906.

SIR: I have the honor to submit a report of conditions and occurrences in the fourth constabulary district for the fiscal year ending June 30, 1906.

The subject of peace conditions in the fourth district must refer naturally to the relations which exist between the different rancherias of Igorots, Calingas, Ilongotes, or Negritos within the Cordilleras as between themselves, or with relation to the Tinguianes on the west side of the Cordillera and the Christians. There is nothing extant among either the Ilocanos or Cagayanans against the constituted government. There is no such thing as organized bandolerismo having the pretensions of a political movement in the fourth district. It is only when an ambitious politician comes from Manila that the subject of ultimate or speedy independence is ever discussed. Now that the time for the selection of members of the assembly approaches, many natives of the northern provinces now residents of Manila return and try through spellbinding on independence to make themselves "favorite sons."

A ladrone raid into Isabela from the south, in which Palanan was the victim, and the bungling work of two crude robber bands in La Union are the reminders the people have here of the troubles of their less fortunate countrymen in the southern provinces. In the case of La Union the conditions are due to a lack

of strict surveillance by a wide-awake senior inspector. Maladministration by municipal police officers has contributed to the unsavory conditions. The carabao thieves in Ilocos Norte and Sur and Cagayan have had their operations materially curtailed by the activity of the senior inspectors and forces in those provinces. The cooperation of the police in Ilocos Norte and Cagayan was a potential factor in the carabao campaign. The campaign against the slave trade and conciliation between Calingas and Christians in Isabela was brought to a standstill or retarded when the First Company was taken out of the district, and but little can be done until it returns.

All resources available in the district are thrown in the direction of peace-making and in drawing the mountain people within the pale of civilization. This district has within it, among its primitive people, a promising prospect for the near future. There are 200,000 people and possibly more in this district, who now figure but little politically. These people, virile and untainted by the vices, can, by careful and generous treatment, be made a positive quantity in the body politic in a very few years.

There is no longer any question about the ability of the government to handle the Igorot. Aside from his head-hunting, which he is giving up under the influence of constabulary intercession and peacemaking, he is proving himself a loyal and uncomplaining subject. His industry and conquest over waters which fall from the heavens and the slopes and pockets of the mountains have only been limited by his necessities. The stimulating touch of American civilization has increased his wants and sharpened his wits and aroused his genius, and he has begun to knock at the doors of commerce with the products of his cultivation or his handiwork.

Formerly his traditional head-taking confined him to his rancheria. Now, under the new order of peace making, the Igorot of Balbalasan goes through Lubuagan and scores of other rancherias to Bontoc and thence to the coast, or a Banaue man from Nueva Vizcaya can come alone to the coast at Candon; Gaan and Tolocotoc people cross the divide and come to Lubuagan. These trips would have been impossible of accomplishment two years ago.

The proposition now in hand is that of curbing the Calingas of Cagayan and Isabela. During the past year the Calingas of Apayao have made several hostile excursions into Ilocos Norte. Captains Owen and Knauber have handled the Calingas on the Cagayan side so cleverly that assaults upon the Christians are growing fewer. The extension of the constabulary operations in Ilocos Norte from Banna, Solsona, Dingras, and Piddig to the Cordillera, and from the Santa Matilde and Tadao detachments back of Pasuquin, Bacarra, and Vintara, have checked the Calinga raids, and immense tracts of abandoned land have been reclaimed. The expedition made by Commissioner Worcester from Laoag, via Piddig, through the central Cordillera into the heart of the Apayao country through to Abulug, on the Apayao or Abulug River, and in which the district director, with Lieutenant Atkins and 25 Ilocos Norte soldiers, participated, in March and April, enables the government's representatives to carry to a positive conclusion plans for further gaining the good will and confidence of the Calinga. The Calinga country is a virgin soil for government influences. His hostility dates back many years and grew out of abuses heaped upon him when his necessities drove him from his security in the mountains to the Christian zone to sell his tobacco and other products or trade for salt. A personal investigation of this subject, covering Ilocos Norte and Cagayan, show that all Calinga killing of Christians has been in retaliation for imaginary or real abuses committed by Christian comerciantes or pueblo officials. The sad sequel to those abuses was that innocent people suffered the penalty. The first step on the east side was to put a detachment at Malaueg, in Cagayan. This led to the making of peace and the reclaiming of a large section of abandoned farming lands in that vicinity. Investigation in the vicinity of Pamplona, Sanchez Mira, and Clavaria brought out that as many as 39 Christians of Sanchez Mira and many from the neighboring towns had been killed within a few years by the Calingas. The entire belt of rich farming valleys and pockets lying back of Clavaria, Sanchez Mira, and Pamplona have been abandoned by Christians and by many of the well-disposed Igorots. Calinga vengeance is not visited by a large body of men from the avenging rancheria, but by one or two braves, or perhaps half a dozen, and with the most stealthful and skillfully laid plans for surprise.

Plans for a station at Masimot, the proposed seat of subprovincial government in the Apayao country, when operative will enable the constabulary to get in touch with the principal headmen and rancherias, and predatory attacks by

the emissaries of these rancherias on the country below will cease. The Calinga is not a brave fighter like the Igorot, but he is a crafty, stealthy, treacherous foe. His commercial instincts are, however, more acute than those of the Igorot, and he can be made very susceptible to the influence of honest trade and fair treatment, which must be accorded him in the future. As a step toward organization a sharp young chief of one of the upper rancherias between Dalaos and the Ilocos country has agreed to take a small salary as an agent for the government. It is believed that much trouble can be avoided and better conditions secured through early information concerning abuses against the Calinga. If killing of Christians by Calingas is punished at all the punishment should be directed against the rancheria and not against individuals, as the murder of Christians by Calingas is directed by the headmen of the rancheria and not by an individual. If such a strong community interest can control the acts of individuals, the government's representatives with tact can certainly influence from the fountain head on the Apayao River the future acts of the 50,000 or 60,000 people who are now so much a menace to civilization. The Calinga country has very extensive cultivation, is rich in its products, and under the new régime will contribute extensively to the volume of tobacco and foodstuffs coming into the Cagayan Valley. At present a few comerciantes of confidence manage to buy some of the Apayao product, paying in beads and cheap ornaments a very small percentage of the value of the Apayao products.

THE CONSTABULARY.

Reorganization of the constabulary in the fourth district progressed slowly, painfully so, on account of the absence of its officers either temporarily or permanently. The necessities of the service in the southern districts very seriously interfered with perfecting the organization in the fourth district. It is only within a few months that a skeleton organization could be attempted.

The officers who have been in the district during the year have worked hard and conscientiously. The constant fear of accidents, or possible abuses in the absence of officers, by noncommissioned officers while on expedition or patrol has retarded the work. There is no district where it is so very necessary to have careful and discreet officers as in this jurisdiction. Fortunately the year has passed with but few complaints against either officers or men. The friendly attitude and confidence of the people in the constabulary is growing stronger. With the exception of La Union there has been entire harmony between the provincial officials and the constabulary officers.

THE RATION SYSTEM.

The contentment and good service rendered by the enlisted men of the constabulary may be attributed to the ration system as much or more than to any other agency. The mess plan and management by the officers has been so economically carried out that ample savings are always available for the creature comforts of the men. Such equipment as cots, mosquito bars, table ware, lavatories, athletic goods, musical instruments, and other purchases from mess savings have conduced to contentment, discipline, industry, and better ideals of life among the enlisted men. They realize that they never fared better and as a rule are beginning to look upon the service with its possibilities as a career. The establishment of a matrimonial row like that at Lubuagan, Sapid, and Bontoc, for those soldiers who have families is being provided for. It is the intention to make this feature a consideration wherever new barracks are being constructed and to make similar provisions near the cuartels already in use. It is believed that this system will build up a strong veteran organization.

AN ARTIFICER.

The district director recently submitted for the consideration of superior authority a plan for the organization of a corps of artificers. It was suggested that competent carpenters be enlisted into the constabulary, one to the company, and be given the rank and pay of a sergeant, thus attracting skilled men to the service. It was set forth that the carpenter, being furnished with a set of tools, could make all minor repairs on cuartels and attendant buildings, keeping them in good condition and preserving their usefulness at no expense to the government; could build clothing chests for the men of uniform pattern and supply the quarters with all necessary furniture. When funds were available

for new cuartels the artificers of several companies could be assembled under a competent carpenter—Lieutenant Harris, for example, in the fourth district—and the work be done at a great saving to the government. Steps have already been taken by the district director to have the companies, through the considerate chief supply officer, provide themselves with carpenter tools from mess savings with a view to carrying out the scheme in this district under the present strength. Thus equipped, quarters now badly in need of repair, lacking bunks, lockers, mess tables, benches, etc., can be speedily furnished from boxes and material at hand without expense to the government. The tools will greatly assist the men of families in providing themselves with a casita in a proper location in proximity to the garrison. The carpenter shop of each company will, as opportunity offers, have a number of apprentices from the command under the instruction of the artificer, who may be a first-class private or a corporal with its attendant authority. This training will carry its benefits into the economies of the general community.

CONSTABULARY SCHOOLS, ETC.

Throughout the district, constabulary schools have been conducted where officers were available. In provinces such as Lepanto-Bontoc, Union, and Ilocos Norte where supply officers have been acting senior inspectors during the greater part of the year, but little was done beyond the routine drills in the way of instruction. The constabulary of the district comprises a great many English-speaking soldiers. Now that officers are being supplied the district, better instruction is to be expected.

TELEPHONE LINES.

It is earnestly recommended that telephone lines be built between the following points:

From Bontoc to Lubuagan; from Lubuagan to Balbalasan.

In Cagayan, from Aparri to Abulug; from Abulug to Sanchez Mira; from Sanchez Mira to Clavaria; from Abulug to Pamplona; and from Maunan to Malaueg; and from Malaueg to Piat.

In Abra, from San Jose to Sapid, and that a telephone station be cut in at Bucay, midway between Bangued and San Jose.

In Ilocos Norte, from Dingras to Piddig and Salsona; from Dingras to Banna.

BENGUET.

Benguet Province is well favored and has neither politicians nor bands of ladreses, and religion has not bothered the masses. The real work of the constabulary is to protect the natives from the gambling tendencies of unemployed Americans in the vicinity of the Benguet road, and to preserve peace between some of the northern rancherias. The senior inspector, Lieut. T. H. F. Diederich, and Governor Pack work in such harmonious relations that the best of order prevails. The special event of the year has been the establishment of a station at Loo, in the extreme northern end of Benguet, a locality entirely within the influence of the Lepanto culture. The governor turned over for the use of the constabulary a municipal building in Loo.

In March the governor made an earnest request for a detachment at Loo, as numerous busole bands were then operating in the vicinity of Bugias, killing the inhabitants thereof. Since the detachment has taken station at Loo their patrols have been active and the desired results attained. The feud between Bugias and Palatang has cost each side a few heads, and cattle stealing from one another and some on the outside has been the pastime of both, and an occasional boy has been taken along with the live stock. The first time the constabulary soldiers visited Palatang the natives rolled rocks on them, and were fired on in return. A challenge to fight was afterwards cleverly avoided by the Igorot private in command of the detachment. An exhibition of the work the "shooting sticks" could do was followed by a canao. The relations between the constabulary and the warring factions are now quite satisfactory. The people of Palatang of their own accord offered to build the trail to Nueva Vizcaya. The new station taxed Lieutenant Diederich's strength to such an extent that, having to maintain a jail guard, furnish orderlies, and other service during the Commission's sessions, it became necessary to lend him a detachment from La Union under Subinspector Hombrebueno. That detail held the Camp Four station until recently. The conditions in La Union of late made it imperative that the Camp Four detachment be returned for field service at Rosario.

While Lieutenant Diederich has taken special interest in drilling and disciplining the municipal police—50 in number—he has not been asked to take over their control. They are used, however, as guides for the constabulary patrols.

BENGUET CONSTABULARY.

It is most surprising, considering the amount of detailed service and patrol work done by the constabulary of Benguet, that they should be able to make as fine a showing in drill and company movements as they do. The discipline maintained is very creditable to the senior inspector. An inspection of the station at Baguio in June, in the absence of the senior inspector, who was on expedition and inspection in the northern part of the province, was gratifying in its results. Lieutenant Treadaway, who is temporarily stationed at Baguio, turned out the detachment for inspection. The equipment, clothes, and personnel were excellent, the drill snappy, and movements well executed. In quarters the display of equipment and effects was complete, odorless, and uniform. The kitchen, dishes, and every appurtenance were in methodical neatness and cleanliness. The stables were the best arranged and most comfortably kept in the district.

The mess book shows, at both Baguio and Camp Four, that the men are given ox tongue, codfish, rice, potatoes, prunes, mutton, hahn, bacon, apples, salmon, corn bread, sauerkraut, corn, beef, tomatoes, and beans, and the monthly statement of subsistence and expenditure shows a gain of from ₱10 to ₱15 a month in mess savings. This must certainly be due to Lieutenant Diederich's economical management, as the cost of living is much higher than in neighboring provinces, where the savings are not greater and in instances none are made. It is believed that the varied diet in the Benguet constabulary prevented a recurrence of beriberi this year. Lieutenant Diederich, at his stations, requires the cooks to keep a pot of tea brewing constantly for the use of the men on guard and for men off guard who may care for it between meals. He attributes the excellent health, sobriety, and endurance of his men to the constant use of tea as well as the varied diet.

The conveniently arranged kitchen was built at Lieutenant Diederich's expense, an instance of that officer's unselfish interest in his command.

ROAD BUILDING.

Governor Pack has built a wagon road from Baguio to Trinidad. It had hitherto been a trail. He has also completed a new trail around the side of the mountain toward Sablan. The old trail over the top of the mountain is a difficult one. The new trail, not difficult to maintain, of very even grade, cuts out considerable distance. The governor also built a new trail from Benguet-Union boundary around the mountain side to the Baoang River above Libsuan, within 2 miles of Nagnuillan. He constructed the new trail because he had plenty of labor and to demonstrate to the people of Union that if they have the means or disposition they can build a road for carratons to the Benguet line, and the remainder of the road, of easy grade, can be constructed in Benguet at no great outlay. A carraton road to Baguio, a very ordinary undertaking, could be covered in a day in good weather, and La Union would be the great gainer. It is surprising that some one does not now operate a pack train between San Fernando and Baguio, an easy day and a half's journey. It costs the government 7 cents a pound to get goods from Dagupan to Baguio, while it ought to cost half that amount by pack train from San Fernando.

CROPS.

The yield of coffee in October was larger than it had been for years. The selling price was about ₱12 per cavan. For some reason a great many of the coffee trees in Benguet have been abandoned. This may be due to a scarcity of labor or because cargadoring has made it too dear for agricultural purposes.

The crop of Palay was bountiful and quite general. Wild hogs and deer are an annoying and constant menace to the camote crop. The white potato crop just coming in is a plentiful one this year. The product sells for 40 centavos per canasta in Baguio, and ₱1.40 down on the Union coast. A Benguet canasta has a capacity of about a peck.^a

^a Information under the following headings accompanying this report is on file in the War Department: Stations; Events; Fire Fighters; New quarters.

CAGAYAN.

Peace conditions in Cagayan prevail, even in all the Christian zone. There are no outlaw organizations. The long-standing feud between the Christians and the Calingas is dying out in those sections where constabulary operations have been active. Since the station has been established at Malaueg the Christians have returned to the town and have reclaimed the farming lands they deserted on account of the bloody forays by the Apayao Calingas. From time immemorial the Calingas have been against the Christians, alleging all sorts of abuses, when they (the Calingas) were forced to traffic in the Christian territory for salt and other necessities. Captain Knauber and Lieutenant Greene, in frequent expeditions among the Apayaos, the Guinabal, and other hostile sections have been a menace to violations of law on the part of the Calingas and Christians. Unfortunately, the Christians west of Abulug, south of Sanchez Mira, Pamplona, and Calvaria have been using the Negritos as a medium or belt of patrol protection because of the intense hatred by the latter of the Calinga. The Calinga's fear of the Negrito's poisoned arrows gives the Christians of the aforesaid pueblos a partial immunity from Calinga attacks, although a record of 34 murdered Christians of Sanchez Mira and many more from Clavaria and Pamplona greatly retard agriculture and the cutting of timber in those sections. The constabulary has been unable, by reason of lack of American officers, to command the situation. Fortunately the time has arrived when tactful officers are available. Steps are now being taken toward the establishment of a subprovince of Apayao, with Lieutenant-Governor Hale, now of Amburayan, as the official in charge of the organization. With this plan is a new station of constabulary at Masimet, the nearest and most accessible point from the Tuguegarao side by way of Malaueg. When consummated, a section of fertile country as large as Cavite Province, peopled by the virile and industrious Igneks, or Calingas, will enter into the economics of the province and become a contributory factor to the commerce of Cagayan. The Calinga, judging from what has resulted from the government's pacific policy in Isabela, is destined to become as important an element agriculturally in Cagayan as his cousin, the Tinguiane, is in Ilocos Sur.

The district director, who accompanied the honorable secretary of the interior in the expedition from one end of Apayao country in mapping and sketching, took note of the different rancherias, the people, and the character of production, and feels qualified from his knowledge of the subject, combined with that of Captain Knauber, who has also been making the Calinga a study, to guarantee that a historic menace to civilization will be converted within a very few years into a harmonious component of peaceful Cagayan.

Lieutenant Greene, commanding the First Company, with 22 men, made an expedition to the Calinga rancherias south and east of Malaueg. The lieutenant, in reporting his expedition, says:

"In all 14 ranches were visited and given flags. These people are very thrifty and raise an abundant supply of sugar cane, rice, bananas, and ubi for their own subsistence and for the purchase of what other few things they require. The trails are very bad, and, due to many rapids in the river, transportation is very difficult. These people are very much afraid of the Apayao Calinga and are always prepared for an attack from these northern tribes. It is the opinion that this visit from the constabulary will prevent this trouble. One tribe, on being shown more help and on being led to believe from our actions that they are a little better than others, will immediately 'lord' it over the others."

PAMPLONA PERVERSITY.

The town of Pamplona, which comprises a great many nipa-vino manufacturers, was inclined to be somewhat hardheaded over the internal-revenue tax, but have succumbed and are paying their taxes. In May a detachment of 12 of the Second Company were stationed for twenty days at Pamplona to make patrols from that place. Their presence there had a good effect on the people who had commenced to think they were a little government in themselves. There was a question between the justice of the peace and the auxiliary. The auxiliary justice of the peace suspended the actual justice for personal reasons, and the sergeant of police refused to serve a warrant turned over to him by the actual justice of the peace on account of this suspension. The whole affair was the result of personal enmity. Everything has been settled satisfactorily.

The deputy to the provincial treasurer is at Pamplona seizing property and selling it for taxes. There are several delinquent taxpayers in Cagayan and a good deal of property is being sold at public auction. The people have been very careless and have let this tax run up from 1901 to the present year and now are unable to pay. They are making many complaints, saying that owing to the damage done crops by heavy storms and the low prices for products raised they are unable to pay.

A TRIP TO BATANES.

Lieut. Guy H. Greene made a trip to the Batanes Islands. In his report he says:

"The coast guard *Balabac* left Aparri May 17, arriving at Calayan same afternoon, where certain witnesses were picked up for Basco, to be present at term of court to be held at that place. During the night a heavy storm drove them into the harbor at Camiguing, where they stayed three days and three nights for shelter from the heavy weather, returning to Aparri for food and other supplies May 21. On May 22 another attempt was made, they arriving at Basco in the afternoon of the 23d. Conditions are very good as to peace and health. There are about 7 or 8 civil cases and 14 or 15 criminal cases to be tried, none of which are of any great account. The town still shows the effects of last year's storms. However, the people are not lacking food. Some of the rice sent by the insular government last year is still stored in the municipal building."

A DRAWBACK.

Transportation is the one drawback in Cagayan. It is but seldom that one can make Tuguegarao from Aparri, or vice versa, in a steamer. The river is navigable a considerable part of the year by small launches. These, however, can accomodate but few passengers. Supplies have to be moved in *barangays*. There are so many small streams and *esteros*, marshes, and swampy land that only during the height of the dry season with a very hot sun can one be safe in traveling. If the pack outfit, six mules, etc., asked for in letter of senior inspector is authorized it will solve, to a great extent, this brain-racking question. A viray has been furnished from Vigan for the Cagayan River which will be a great help. Transportation overland between Aparri and Taguegarao, in fact throughout the entire province, has been facilitated in the many improvements made in roads and building of new bridges. Preparations are being made for still greater improvements. *Esteros* which were formerly impassable and always dangerous are being bridged.

MUNICIPAL POLICE.

The municipal police of Cagayan are for the most part a very efficient body of men and the constabulary can justly profit by their example, especially those of Tuguegarao and Aparri. Under existing conditions, however, it is difficult to obtain the best results, as the policemen have what is known as a political job. They have to do a great many things for fear of being discharged. With change of presidents they have to change their allegiance. Too many of the municipal officials feel that the police are under their orders. They seem to have no respect for discipline. Municipal officials meet a policeman, and if they happen to think of something they want, the policeman has to leave his post or whatever duty he is on. With but two officers it has been impossible for the senior inspector under existing laws to see and attend to this matter.

THE SCHOOLS.

Educational work is being carried on with a good deal of force, which is shown by the new school buildings being constructed to accommodate the 11,282 pupils. Mr. J. J. Coleman is district superintendent, with 20 American and 171 native teachers. Through the untiring efforts of Mr. Coleman many improvements are being made. Eleven acres of good ground are used in the instruction of agriculture. The most improved methods are being taught and practical work is being carried on under charge of Mr. Fuller, the instructor. A small but good modern native house is used in the study of domestic economy. The provincial high school, under the supervision of Mr. A. L. Burnell, is giving most

excellent results. The building now used, from the latest information, is to be turned over and remodeled for a girls' dormitory. A new building will then have to be furnished for the high school. It is also understood that complete arrangements for instruction in manual training are being made.

THE CONSTABULARY.

Captain Knauber has a practical, well-disciplined, finely drilled, and hard-working constabulary. The first company was able to maintain its musical organization. It is a common thing for the men to stand guard mount for the men detailed and who at that ceremony are playing in the band. Better men, neater and smarter in appearance either on duty, in drill, on patrols, or serving warrants and making arrests in the province of such immense proportions, are not to be found in the service. In spite of the high cost of living in Cagayan Valley the wise economy and resourceful officers have been able to make small savings each month. The men of both companies made fair scores at the gallery target practice. New haversacks and canteens have been furnished. The men were very poorly clothed, because the supply on hand were all small sizes. The old stock of leggings and shoes would not stand more than one trip. The new supplies are of better material. The health of the men in both companies has been exceptionally good.

NO CHURCH TROUBLE.

There has been no trouble beyond a mere ripple at Enrile between the Roman Catholic Church and the Independentes. This matter was settled amicably.

The reelection of Señor Pablo Guzman was a foregone conclusion before the election took place. A third election for presidente with the same result closed the series of contests in Pamplona.

GUN SHOP DISCOVERED.

Captain Knauber, through the aid of the municipal police of Aparri, discovered a gunsmith shop in Talugan, a barrio of Aparri, and secured two serviceable shotguns, eight unserviceable shotguns and rifles which were awaiting repairs, and a large quantity of spare parts. According to information received, this shop has been in existence for several years. During the months of January, February, and March Captain Knauber turned in 45 rifles, shotguns, and revolvers, captured or confiscated.

NEW HACIENDAS.

The Weber brothers have purchased an immense tract of land in the eastern part of the province back of Tuguegarao and will cultivate tobacco. The hacienda Clabbacao, comprising 17,000 hectares, on the west bank of the Cagayan near Amulung, has been purchased by a Mr. Hilbert, from the States. The land abandoned for several years will be put under cultivation.

BRIDGE BUILDING.

A steel truss bridge has been completed by the Atlantic, Gulf and Pacific Company at Aparri at a cost of ₱10,200. Another steel bridge is contracted for for the estero north of Amulung. A wooden bridge with cement piers has also been constructed over the estero south of Tuguegarao. The road and bridges have been repaired between Iguig and Alcala.

OPIUM SEIZED.

Being aware that a great deal of opium is constantly being smuggled in, Captain Knauber sent a couple of his best men out as a smelling committee. They located a consignment valued at ₱3,000 and seized it.

ABULUG CANAL.

An estero of sufficient width, extending from Aparri to Abulug is about to be opened. With a reasonable expenditure virays can operate between Aparri and Abulug in all sorts of weather, can work up the Abulug and Pamplona rivers and through esteros as far as Clavaria, giving a safe, cheap, and easy transportation to the commerce of the west to Aparri.

CARABAO STEALING.

In July and August Captain Knauber moved on the carabao thieves, capturing a number of corrals. These corrals were owned by influential and rich natives, who had a corps of retainers and go-betweens. The result of the constabulary work was the restoration to owners of about 300 carabaos and horses. The influence of the people who were implicated in the carabao industry defeated many of the prosecutions by silencing evidence. They could not, however, prevent the owners of the stolen property from claiming their animals. An industry of nine years' standing has been broken up, and live stock is safe now in the pastures.

ARMS LOCATED.

The district director has been authorized to purchase a number of firearms located among the Calingas in Apayao. These arms were taken from the Apayao River by the Calingas, having been lost there by the American troops which rescued the Gilmore party at Little Naguilian, and by the insurgents. The arms are located as follows: Naguilian, 2 Remingtons; Lapoc, 2 Krag and 1 Remington; Cabugaoan, 1 Remington; Cabanbanan, 2 Remingtons; Alisit, 1 Remington; Natuyangan, 2 Remingtons, 1 Mauser, and 1 Krag; Dibagat, 4 Remingtons, 1 Mauser, and 3 revolvers; Magbalo, 1 Remington; Abid, 1 Remington, and Suyoc, 1 Krag; making in all, 23. The Calingas have no ammunition, and while authority has been given to pay the regular 30 pesos it is believe traffic will be more attractive and effective.^a

ILOCOS NORTE.

During the past year Ilocos Norte had a senior inspector, Capt. E. A. Eckman, during the months of January, February, and March, but in April he was appointed lieutenant-governor of the subprovince of Bontoc. During the few months of Captain Eckman's administration the police forces of the various pueblos were put on a working basis, and the arrest of ladrones and small thieves took on the form of a campaign. It was extremely unfortunate for Ilocos Norte that Captain Eckman's administration came to an end. The fact that the province had had for an acting senior inspector a supply officer who was tied to his accountability in Laoag practically left the province without a senior inspector, and the absence of the influence of that ever-present dominating influence is largely responsible for the bloodshed and disorder of the province. Lieut. Omar C. Humphrey did the best he could and is responsible for the capture of a band of armed ladrones last year, and his tactful administration eliminated from the atmosphere in Laoag all enmity or opposition to the constabulary. The prosecution of the actors in a seditious play in February, 1905, although unfortunate in the manner of the doing, had the effect of effectually discouraging the presentation of plays of like character. The entire matter has ceased to be talked about and is forgotten.

THE SCHISMS.

The independent church movement does not appear to progress, nor is there any agitation among the people. All the church buildings, excepting that at Laoag, are in the hands of the Aglipayana faction, and the field outside of Laoag is abandoned by the Roman Catholics excepting Bacarra, where a Roman Catholic priest has recently taken station and is working acceptably without creating rancor among the people. In Laoag the presidente and other municipal officials are active factors in the independent church. To this may be attributed considerable of the friction in Laoag. During the year the municipality, after having usurped control and the emoluments of the Roman Catholic cemetery ever since the revolution, gave it up under judicial order and then proceeded to close the cemetery on the grounds that it was not sanitary. The governor pointed out the error of its action to the municipality and the matter is now in the hands of the sanitary officials. Later, the municipality demanded and undertook to possess itself of the books of registry of baptisms, deaths, etc., belonging to the Roman Catholic Church and the governor again interfered. Now the municipality has brought an action against Padre Ver and the Roman Catholic Church to compel them to abandon as a burial ground a tract of land outside the

^a Information under the following headings accompanying this report is on file in the War Department: Hospitals, stations, drills.

Catholic cemetery walls and formerly used for interment of persons who had not died within the communion of the Roman Church. This matter is in the courts. Christmas and Easter festival street processions came high leading to public disorder between the Roman Catholics and the Independientes. The tactful Governor Flor manages to disentangle the schismatics and there will be little danger in the future of collisions. Unfortunate Padre Ver, the cura at Laoag, is annoyed to the verge of distraction.

EXPEDITIONS.

During the past year the district director made a number of visits covering different parts of Ilocos Norte. The entire section east of Banna and Dingras was explored and mapped in company with Lieutenant Atkins, then new in his province. The reclamation of the Tinguianes against certain Christians who were attempting to get possession of their lands were heard and referred to the proper authorities. The country lying between Clavaria and Bangui, and between Bangui and Pasuquin, Bacarra, and Vintar, was explored and mapped by the district director. These explorations were to acquaint him with the points of exposure in Ilocos Norte to the Calinga attacks and with a view to placing detachments at such points as would effectually stop sanguinary invasions and encourage the Christians of Ilocos Norte to reclaim their abandoned lands. Lieutenant Atkins, during part of the year, kept up a persistent patrol of the country east of Banna, Dingras, and Piddig, and extended northerly to cooperate with the Tadao detachment, now located at Santa Matilde, covering Pasuquin, Vintar, and Bacarra. The results have been very satisfactory and abandoned sections are again under cultivation.

Lieutenant Atkins's expedition in March, with 24 men, as escort to Commissioner Worcester and the district director from Piddig, into the Cordillera Central and thence through the Apayao-Calinga country, in Cagayan, to Ablug, thence by trail through westwardly to Sanchez Mira, Clavaria, to Bangui, thence in exploration of mountain trail to Bacarra and Pasuquin, covering 300 miles, more or less, was the most important practical event of the year from motives of gaining knowledge of the country and the people who have been so much of a menace to Ilocos Norte agricultural extension. Lieutenant Atkins and his men made a great many friends among the Calingas, and can exert a good influence for peace from his side of the Cordillera. The small band of ladrones which killed the lieutenant of police near Badoc last year again, in January, attempted the murder of the present efficient official, wounding him and boling his companion. For this condition at Badoc, and as encouragement to other municipal police organizations, Governor Flor and the district director agreed upon a limited number of firearms for the use of the police of such municipalities as had shown commendable activity, and with the consent of superior authority the arms have been placed.

The activity of Governor Flor, whose diplomacy is unfailing, is making for tranquillity and increased industry. The relations of the constabulary with the provincial officials, as well as municipal, are most harmonious.

The municipal elections in Ilocos Norte passed off without friction, although a third election in Bangui received the attention of a constabulary detachment as a prevention against disorder.

IMPROVEMENTS AND SCHOOLS.

The important improvements are new bridges and new school buildings. Of the latter, that in Dingras, two-story, wood, with brick first story, iron roof, costing ₱8,000; reconstruction of school building in San Miguel at an outlay of ₱3,000, and reconstruction of building in San Nicolas at an outlay of ₱7,000, are the most imposing. A new trades school and high school building in Laoag, and for which provision has been made, is assured.

If any differences can be noted in the matter of public interest in education, it may be said that it is in favor of the barrios, where the common people often salute Americans in the new idiom.

ASBESTOS INDUSTRY.

The asbestos claims in the vicinity of Payo, between Pasuquin and Davila, and those at Baruyan are being developed and with gratifying results. Señor Emilio Lallave, who is the owner of a large estate in the municipality of Bangui, has contracted with an English firm to take his Doingdoingen asbestos tract

at a valuation of ₱100,000, half in money and the other in stock. The correspondence indicates early operations. These transactions are creating an activity in all lines of industry in that section of the province. It is only a question of capital and labor to make an enormous and richly paying enterprise, as the material is there in apparently inexhaustible quantities.

DISEASE.

While smallpox was prevalent south in Ilocos Sur, there was but one case during the year in Ilocos Norte, and that was Internal-Revenue Officer D. M. Stewart, an American. This immunity must be attributed to the general inoculation of the people with vaccine virus.

Only sporadic cases of animal disease have appeared, and but few animals have been lost during the year.

MAGUEY CULTURE.

The successful demonstration of the agricultural department's stripping machine has created a great revival of the maguey interests. The new acreage of the maguey will double or treble the former product of fiber.

NEW STATION.

The persistent attacks by Calingas in the territory back of Pasuquin, Bacarra, and Vintar led to the selection of Tadao, a barrio lying in the mountains midway between Bangui and the three municipalities, and about equidistant, as a very suitable site for a *destacamiento*. That locality is very fertile, and is desired by the people of Bacarra, Vintar, and Pasuquin, but abandoned on account of the Calingas. The scarcity of constabulary funds led the district director, however, to accept the proposition of the people to erect temporary cuartel at Santa Matilde, closer to the pueblos than Tadao. A sergeant and 9 men occupy the post and keep up a daily patrol, covering the country 12 miles back of Bacarra, Pasuquin, and Vintar, affording security to the agriculturists who have reclaimed their lands, also enabling the people to go to the mountains for timber.^a

ILOCOS SUR.

The arrival of Captain Knoll, the new senior inspector, in January, and the organization of the three companies, with a general policing up and correction of conditions resulting from lack of close supervision, started the constabulary of Ilocos Sur on a new era. The personal supervision of the mess when served has not only insured the men of better food, but has made an improved difference in the savings. The company organizations in Ilocos Sur are complete and the men fully equipped. Lieutenants Heuser and Rowell, commanding the First and Third companies, respectively, are very creditable officers from the constabulary school in Manila, and have been doing active and satisfactory service at their respective stations. The constabulary of Ilocos Sur and Abra is now a finely disciplined, well-instructed, and well-equipped organization.

There is no organized *ladrones* in the province beyond a few carabao bands, mostly composed of four or five persons. These prey upon poor people whose animals are not well protected. This business has been considerably broken up by the constabulary patrols in the barrios. With a single exception, at Narvacan, the municipal police have done nothing toward the capture of carabao thieves. Captain Knoll, to whom the police have been turned over for instruction and superintendence, expects better results in the future. In the past the policemen in Ilocos Sur have been nothing more than lackeys for *presidentes* and other officials. Gambling is permitted to be run openly in Vigan and other municipalities in Ilocos Sur, and nothing is done to stop it. It is a significant fact that Ilocos Sur, the home of gamblers, is the only province in the fourth district where mendicants travel about in bands aggregating from 100 to 125 persons—men and women. It is seldom that beggars are met in the other provinces. In Vigan it is a difficult matter to keep a *muchacho* or a *muchacha*, as they are nearly all confirmed gamblers and can not be trusted.

^a Information under the following headings accompanying this report is on file in the War Department: Sanguinary events; constabulary abuse; constabulary; buildings.

CROPS.

Growing security from ladrones has allowed the number of work animals to increase. The rice-planting territory enlarges accordingly. The crops in Abra and Ilocos Sur have been of a satisfactory character. The greatest increase in food products is in Abra.

The sugar crop at Candon and vicinity aggregated 40,000 piculs for shipment. The farmers, due to the prospect of getting effective machinery, are doubling, and in places trebling, their maguey plantations. Indigo or añil culture is also on the increase in Ilocos Sur.

DISEASES.

Smallpox raged in the southern part of the province and about Vigan during the past fiscal year. During the months of February and March, Vigan alone had 60 cases a day. The death rate was about 10 per cent. The total number of deaths reported in the province from smallpox were in the vicinity of 1,200, mostly children. The Americans, Mr. Stewart, internal-revenue agent, Mrs. Peterson, wife of a missionary, and Mrs. Keech, wife of the district postal and telegraph inspector, were among the victims, but recovered.

THE FLOODS.

The greatest damage done by floods during the year was that in August, when a part of the town of Santa was washed away, four persons were drowned, and a very large number of animals perished. The Roman Catholic Church in Santa, built over fifty years ago, was, like its predecessor, undermined by the Abra and completely washed away. The edifice was one of the largest and most expensive in the province. A valuable part of the town was cut out by the river's encroachment and the remainder of the lower part so menaced that the buildings are being torn down, and with the municipal buildings have been moved to the barrio Pasungun, situated on the slope of the mountain.

ELECTION FOR GOVERNOR.

The election for governor in February was attended by a great deal of excitement. There were four candidates, Felix Angco, Enrique Quema, Juan Villamor, and Señor Gimenez. The activity of the old insurrecto element in behalf of Juan Villamor's election was so demonstrative that Governor Crisologo feared a disturbance in case of Villamor's success. The governor accordingly formally requested the senior inspector of constabulary to be present at the closing hours of the election, and to have a force of constabulary near at hand in case of necessity. The election resulted in favor of Felix Angco, and the result was accepted in good grace by the other candidates.

DESTROYED BY FIRE.

The pueblo of Santiago was destroyed by fire on January 13. The principal part of the town was entirely burned. Loss about ₱50,000. The abundance of rice in that section provided against hunger or suffering.

Fires in the barrios of Santa Lucia and San Pablo of Narvacan burned a number of houses in January. The loss was about ₱5,000.

The fire in Pandan, April 29, took 70 houses, including the constabulary cuartel. The loss was ₱50,000. The province succored the poor with rice.

CARABAO THIEVES.

An old combination of carabao thieves, plying their occupation between Narvacan and Santa Maria, with expeditions into adjoining towns, came to grief through the secret-service work of Sergeant Bigornia. Capturing a member of the gang in Santa Maria, the sergeant secured a confession, which enabled him to capture four old-time carabao thieves with the animals in their possession. Active patrols in the barrios in Ilocos Sur have greatly diminished the number of animals reported missing from time to time.

ALZADO RAIDS.

The Tingulanes in Abra have been exploited to such an extent in the past by the Igorots of Lepanto-Bontoc that it became necessary to place a detachment at Sapid, in the extreme eastern part of the province, as an outpost from San

Jose, each patrolling toward each other, or in other parts traveled by alzados. The establishment of the post at Sapid had the desired effect, and the Tinguianes and Ilocanos have reclaimed vast tracts heretofore abandoned. In March, Mainit threatened Linguy because the people of that rancheria had killed an animal thief whom they had caught in the act and who was a Mainit man. At the time of the alarm Subinspector Ferrandez marched to the scene of the intended attack. The Mainit people say they turned back because the luck bird flew from the wrong side of the trail. The indications are that the change of plan was due to Ferrandez's prompt compliance with orders. About the same time that Mainit was expected on the south side of Abra the Apayaos were threatening to attack and destroy Tineg on the north. Captain Knoll made a three days' march to reach the threatened rancheria. The expected did not happen. The object of the threatened attack was a young woman of Tineg who had been wooed, but not won, by a Calinga of Apayao. The district director, after an investigation among the outlying rancherias of Abra, made a trip to Guinaan and Mainit in Lepanto-Bontoc, assembled the chief men, and warned them that all attacks on the Tinguianes must stop forthwith, and, furthermore, the custom of levying tribute upon the Tinguiane rancherias must stop or swift punishment would follow each or any transgression. Both Guinaan and Mainit solemnly promised to obey the order. Notwithstanding the warning given Mainit, some of the alzados from that rancheria caught and tied up a Tinguiane from Sagayon in the mountains of Posoey. The approach of the constabulary caused the release of the Tinguiane.

The trouble between Danac in Lepanto-Bontoc and Mayabo in Abra has been settled through the intercession of Subinspector Ferrandez, who had the chiefs come to San Jose. During the past year some of the Mayabo alzados took a head from Danac. In settlement Mayabo paid Danac a carabao, 2 iron pots, and ₱4. Danac demanded another pot, ₱4, carabao, or fight. It was finally agreed in Subinspector Ferrandez's court of arbitration that Mayabo should pay over to Danac 2 more iron pots and ₱4, and peace was declared.

THE RELIGIONS.

The independent church movement in Ilocos Sur does not have the animation in it that it had early in 1905. A few of the clericos who had joined the new movement have returned to the mother church. It is possible that the independent movement may be as strong as formerly, but it is quiet, law abiding, and there is no agitation that would tend to create trouble. The natives do not appear to have any feeling of resentment against one another on account of a change of faith. The missionaries, both Christian and Methodist, have a large following throughout the province and it is not alleged that the Protestant movement is ever interfered with or treated lightly by the natives.

THE SCHOOLS.

The girls' dormitory in Vigan, Miss Clendenin, preceptress, is popular with the people and has proven a very great success. This year the attendance of young women from the municipalities of Ilocos Sur is a very substantial increase over last year. The young women in the dormitory come from good families, but not from wealthy homes, and are therefore choice material for future usefulness in the educational department. A feature of the dormitory this year is the sustentation by the government of four Tinguiane girls, selected from rancherias in Abra for their likelihood and advancement in English. This is with a view to training them for teachers among their own people. A fifth Tinguiane girl is sustained in the dormitory by a friend of the Tinguiane people, and like her sisters, is a fine prospect for Abra's educational department. Six Tinguiane boys have also been selected to receive government maintenance in the Abra trades school. The advancement in education among the Tinguianes exceeds in many respects that observed among the Christian barrios.

The walls of the new trade school in Vigan are up and the building may be dedicated on Washington's Birthday.

THE VIGAN HOSPITAL.

The building used for hospital purposes in Vigan and for which ₱30 per month was paid has become entirely unfit for occupation. Another building has been engaged at ₱40 per month rental. It is being reroofed and renovated throughout. By the end of the month Lieut. G. M. Malkin, medical inspector in charge, will have made the transfer. A room is to be provided for the use of constabulary officers and all civil government officials at the usual dollar a day rate. This hospital can then accommodate the officials of Ilocos Norte, Ilocos Sur, Abra, and Lepanto-Bontoc, thereby furnishing for unfortunate officials the opportunity to receive treatment by an American physician and surgeon, with all the security and comforts of hospital attendance. The report of the district surgeon, Capt. J. M. Wheate, is respectfully submitted herewith:

OFFICE OF THE DISTRICT SURGEON,
Vigan, Ilocos Sur, P. I., June 30, 1906.

THE ADJUTANT, FOURTH DISTRICT,
Vigan, P. I.

SIR: I have the honor to furnish the following report of the operations and condition of the medical division of this district for the year ending June 30, 1906:

Personnel.

District surgeon, stationed at Vigan, Capt. J. M. Wheate.

Vigan hospital, Second Lieut. and Medical Inspector George Malkin, commanding, 1 corporal and 5 privates, medical division.

Tuguegarao hospital, First Lieut. and Medical Inspector Thomas E. Moss, commanding, 1 corporal and 2 privates, medical division.

Province of La Union, province of Isabela, and subprovince of Abra, 1 private each, medical division.

This gives a total of 3 medical officers and 12 enlisted men, 2 of which are corporals, the full quota under present regulations.

During the first six months of the year the administration of this office was under different management at different times. Capt. T. C. Walker, district surgeon, was relieved in this district in October to become superintendent medical division, and First Lieut. and Medical Inspector Thomas E. Moss, commanding the hospital at Vigan, was detailed as acting district surgeon until relieved upon my arrival at this station on January 2 of this year. During these first six months of the period covered by the report the recorded data in this office show little variation or departure from the routine events of the preceding months.

The most important change in the affairs of the division was the reduction of the enlisted personnel and the advance in rank and salary of the commissioned officers. This latter made it possible to replace the former nongraduate medical inspectors with well-qualified graduate medical officers, which has since been accomplished throughout the entire division.

In the reduction of the enlisted strength from 107 men to 57 it was found necessary to reduce the number in the fourth district from 18 to 12 men, 8 of whom are permanently assigned to the Vigan hospital and the remaining 4 to the Tuguegarao hospital. From these fixed units it is required to detach men from time to time for service in the various provinces of the district. The present number is wholly inadequate to meet the demands for an intelligent and satisfactory care of the sick and disabled constabulary in all stations of the district.

The purpose in assigning 8 enlisted men to the Vigan hospital and but 4 to Tuguegarao is to enable the district surgeon to direct more intelligently the distribution of the emergency men for detached duty in the provinces. The men at Bangued and San Fernando belong to Vigan hospital, while the one at Ilagan belongs to Tuguegarao. Until recently one man has been stationed at Laoag, Ilocos Norte, but his discharge from the service has left that station without enlisted medical attendance, owing to the fact that no properly trained men are at present available at the Vigan hospital. Four of the 5 privates at this hospital are recruits with but from three to four months' service, and are not yet believed to be capable of rendering the service required under such conditions. These men are being taught daily, both theoretically and practically, and as soon as properly prepared one will be detailed for duty at Laoag.

It is next to farcical to attempt the successful administration of a hospital

in which enlisted men perform the entire service from the semiprofessional to the domestic with less than 4 men. There should be not less than 6.

Then there should be a trained hospital man at each company headquarters throughout the district. To accomplish this would require nine men, exclusive of the companies stationed at Vigan and Tuguegarao, in which stations are located permanent hospitals. This plan if followed would leave but three men to supply the service to two hospitals. Such a plan is manifestly impracticable, and the inevitable result is a neglect and disregard of the professional and sanitary welfare of a part of the commands throughout the district.

With a view to overcome, in a measure, this deficiency of professionally trained men, upon approval of the district director, a circular letter was sent from this office early in the year to each senior inspector in the district, inviting attention to the reduced personnel of the medical division and the consequent withdrawal of medical attendance, and suggested that from each company there be detailed two men to attend a three months' school of instruction at one of the hospitals, whichever was the more accessible, and after careful special training in the essentials of first aid and elementary medicine, to be returned to their respective commands for permanent duty. This proposal met with general approval of the senior inspectors in theory, but because of the withdrawal of so many troops from this district for service elsewhere about this time it appeared impracticable to spare the men from each company for the detail, and hence the situation remains unchanged.

The hospitals at Vigan and Tuguegarao have rendered good service in so far as their meager equipments permit, but they are so poorly provided with the most ordinary essentials, not to speak of the desirable aids and accessories, almost equally indispensable, that their usefulness is materially handicapped.

It is irrelevant in this report to attempt explanations or excuses for this state of affairs. Suffice it to say that every consistent effort has been made in due process during my incumbency as district surgeon to remedy the faults, but little has been accomplished.

The hospital building at Vigan is wholly unsuited to the purpose, and, besides, is in a very poor state of repair. Among my earliest efforts to improve conditions at this station was a thorough canvass of desirable buildings available for a hospital, but none was to be had at a rental within a reasonable limit. I am pleased to report, however, that arrangements have been made with the owner for the complete remodeling and repair of a well-located building, which, when ready for occupancy, will provide a most satisfactory hospital. There will be provided in this change of buildings a separate ward for sick employees of the insular government, as contemplated in General Orders, No. 66, series of 1903—a provision heretofore lacking in the Vigan hospital. The necessity for this provision in a constabulary hospital should not be underestimated. In the first place, it is a part of our legal obligation, and in the second, it tends to strengthen our position and emphasize the measure of our usefulness to the community.

The building at Tuguegarao is well located and has premises adapted to vegetable gardening, and which is fairly well utilized. The building is in very good repair, but is too small and but little better adapted to hospital use than is the one at Vigan.

The physical conditions in the district, together with lack of transportation, renders it impossible to send all sick to the hospitals for treatment, and under the present status of the medical division we can do no better than to receive such as can be brought to hospitals and in stations to which hospitals are inaccessible to station a trained enlisted man of the medical division to render such service as he is able. Serious cases or cases of a grave surgical nature must, of necessity, be sent to the most accessible hospital, whether constabulary or other, or a medical officer sent to the patient.

Needless to say, this method is unsatisfactory and must have been responsible for much preventable suffering in the past years of the service. There seems but one rational remedy, and that is the establishment of a hospital at each provincial capital.

Hospital statistics.

Vigan Hospital.—Number of admissions to sick report during the year, 126; number treated in the hospital, 105; number treated in quarters, 21 (station of Vigan); total days lost by sickness, 884; average number of days on sick report, 7.

Classification of causes of admission to sick report: Febrile diseases of all kinds, 28; diarrheas and digestive disorders, 30; surgical cases, 21; minor ailments, 43; venereal diseases, 4; number of deaths, 0.

Tuguegarao Hospital.—Number of admissions to sick report, 125; number treated in hospital, 75; number treated in quarters (station of Tuguegarao), 50; total days lost by sickness, 721; average number days on sick report, 6.

Classification of causes of admission to sick report: Febrile diseases of all kinds, 50; diarrheas and digestive disorders, 13; surgical cases, 58; minor ailments, 4; venereal diseases, 1; number of deaths, 3.

Expenses of the hospitals for the year.

Vigan Hospital:

Rent	₱360. 00
Laundry	33. 24
Fuel	20. 63
Petroleum, about	12. 00
Total	425. 87

Tuguegarao Hospital:

Rent	360. 00
Laundry	41. 55
Petroleum, about	12. 00
Total	413. 55

The items above enumerated are believed to include the entire expenditures for the maintenance of the hospitals except the cost of medical supplies and equipment and salaries of personnel.

It will thus be seen that they are administered in an exceedingly economical manner.

Recommendations.

In view of the rumors of contemplated radical changes in the organization and administration of the medical division, it may be superfluous to recommend such changes, expenditures, and improvements as I feel to be desirable. I shall at least invite attention to a very few which my experience as district surgeon in this district and elsewhere have impressed upon me as being especially desirable:

First. In view of the deficiency in numbers of enlisted men of the medical division I would urge the advisability of carrying out my earlier recommendation to train at least two privates of each company in the district for service in their commands. A detail of one man from each company sent to a hospital for three months' instruction, followed by a second like detail upon the return of the first, would not materially interfere with the efficiency of any company. The advantages to be derived from this course would be of lasting benefit. No command need be helpless or in need of the assistance of intelligent "first aid" and elementary medical treatment, regardless of the strength of the medical division.

Second. Supplementary to the foregoing, I would have provided a company medical chest. This chest should in no sense be a cumbrous affair, containing supernumerary drugs and appliances. It should be small enough to be conveniently carried by the "practicante" of the command upon every expedition, in addition to his ordinary equipment. This chest should contain only such medicines, dressings, instruments, etc., as experience has taught are most likely to be required upon expeditions such as the constabulary are called upon to make and only such list of supplies as the "practicante" has been taught to use intelligently. To put it otherwise, these soldiers should be taught a few subjects only, and well taught in that restricted field, then supplied with only such medicines and medical supplies as they can wisely use. Each permanent station, whether company or detachment, should be supplied with a chest. There should be provided for each chest, in addition to the preceding, a compendium or reference handbook containing brief, but explicit, instructions upon all subjects relative to the nature and application of medicines and a brief treatise upon the few diseases and injuries most frequently encountered among soldiers, together with rational treatment. Such a book was prepared in

manuscript by the undersigned a year ago by direction of the chief supply officer, but for some reason it remains unpublished.

Third. A larger and more commodious building should be provided for the Tuguegarao Hospital, so that a ward for the treatment of sick insular employees would be available.

It is not possible to so treat such patients at present in either of the hospitals of the district, and since government employees in Cagayan and Isabela are so far removed from any civil hospital it seems really obligatory for us to provide against this deficiency.

With the belief that these recommendations will commend themselves to your favorable consideration, I have the honor to be, most respectfully,

JUSTUS M. WHEATE,
Captain and District Surgeon.

NOTE.—Information under the following headings accompanying this report is on file in the War Department: Tragedies, band, boat crew discharged.

ISABELA.

But for the raid on Palanan on June 24, by ladrones from Tayabas, the year would have passed with no very exciting event in Isabela. The looting of the town of Palanan of valuable goods and ₱4,000 by the Casinguran band is what is liable to happen in almost any of the towns of the southern part of Isabela, as it is quite out of the question to keep up the system of expeditions and patrols formerly made for security of the province when there were two companies of constabulary on duty in the province. Early in February Lieutenant Upham, in compliance with orders from the acting director of constabulary, marched from Ilagan with the First Company for duty in Rizal Province, thus leaving the entire province to be handled by Lieutenant Hanlon's company, with half his command at Echague and the remainder in Ilagan. Isabela Province in territory equals Cavite, Batangas, Laguna, Rizal, and Bulacan provinces, and the city of Manila. The total absence of political intrigues or troublesome religious propagandists has all conduced to a state of general tranquillity and security to person and property. There is a constant fear, however, that roving bands of ladrones may flee from hard pressing in Tayabas, Rizal, Bulacan, Nueva Ecija, or again from Nueva Vizcaya and get a foothold in Isabela. There is no indication, however, that the people, now realizing the blessings of freedom from ladrone visitations, would tolerate another Sibley or Tomines. Prior to February not a week passed, except when high water prevented, but that there were expeditions out from Ilagan and Echague, and the tranquillity of the province and small amount of crime is due to the aforesaid vigilance. It is earnestly hoped that the conditions in the southern provinces may permit the return to Isabela of the First Company, as it is only by the active and constant patrols on the part of the constabulary that the fourth district is kept tranquil. There are plenty of troublesome spirits in all parts of the Cagayan Valley, who would promptly begin general petty ladrone operations, and possibly form large bands, if it were not for the eternal vigilance which has been kept by the constabulary. Several reports have been circulated that Pantaleon Villafuerte, an old ladrone, had returned. The rumors have not been verified.

WANT TO ELECT GOVERNOR.

Politically speaking, there is a growing sentiment in Isabela that her people are entitled to the privilege of electing their governor, although they find no fault with the present chief executive, Blas Villamor. At the last assembly of municipal presidents in Ilagan the subject was brought up and a petition was addressed to the governor-general requesting permission to elect a governor in February, 1907. This action was not prompted by any feeling toward the present governor, but simply to secure the rights now enjoyed by other Christian provinces. Captain Owen in his annual report says:

"The Hon. Blas Villamor has been governor in Isabela during the entire period covered by this report, and has performed his duties and obligations in a courteous and highly satisfactory manner with all concerned. Governor Villamor is an energetic worker and always stands ready to give a helping hand in case of need, especially in all matters appertaining to the betterment of conditions in his province. During the year the governor has been instrumental in the establishment of the pueblo of Palanan, formerly barrio of Ilagan; also

two provisional townships in the territory of Calingas, one at San Mariano, jurisdiction of Ilagan, and one at Cabanatuan (Sili), jurisdiction of Gamu. Aside from his other obligations the governor has given his closest attention to the subject of schools, as he is a firm believer in giving all the children in the islands a good English education."

The senior inspector further says:

"Governor Villamor is a man fully qualified for the position, and is a hard, loyal, and earnest worker for the betterment of the province. This fact seems to be generally understood, and for this reason, if no other, the inhabitants like him and cheerfully comply with his requests and directions."

The relations between all branches of the government have been entirely harmonious. The province has 10 municipalities, with about 69,000 Christians. During the year two municipal treasurers defaulted and are now awaiting trial.

INDEPENDENT CHURCH.

Naguilan is the only pueblo in which the Aglipayano Church has its organization within the center of population. Echague, Tagle, and Cabagan Nuevo have small independent churches in their barrios. Recent trouble over church property between the Roman Catholic Church and the independents in Naguilan and Tagle was amicably adjusted by the interested parties without recourse to the courts.

The Right Reverend Bishop Dougherty has just completed an official visitation in the Cagayan Valley. His presence aroused a great deal of religious enthusiasm, as it had been many years since a prelate of the Roman Church had visited many of the sections reached by the bishop. He traveled as far south as Carig and Candon, and as far west as Clavaria. There is no bitterness toward the friars among the people of the Cagayan Valley, and those at Tuguegarao are well received wherever they are pleased to go in the Cagayan Valley.

THE STORMS.

The province has been severely visited by baguios during the year. That on December 18, 1905, which caused so sudden a rise in the Cagayan River was so violent that 40 or 50 houses in Echague were torn open and destroyed, and almost all the tobacco between Echague and Ilagan was swept out by the flood. The second baguio also struck Echague, doing great damage, and almost wiped Palanan off the map. The damage to the tobacco crop in the province was estimated at ₱125,000. The people who have but one idea on crops are left quite poor, while those who diversify their plantings have recouped somewhat and have an abundance to eat.

THE SLAVE TRADE.

The senior inspector at one time had the slave trade well under surveillance, and in September arrested three Filipinos, who were charged with buying and selling slaves in Echague and Cauayan. Interference by the constabulary with a custom which had prevailed in Spanish times was resented. At the present time there are in Echague about thirty slaves in the possession of old families. The slaves, who are mostly old, are well contented and objected to being taken away from what to them was a home. Their owners agreed to pay the slaves small wages, and in such instances it seemed more humane to leave the slaves where they had spent their best days for what is now a place of shelter and daily rice, to turning them to a freedom they do not desire and which would mean greater hardships than they had endured. The return of Lieutenant Upham with the First Company will renew the campaign against slave buying. The victims of the trade are mostly boys and girls caught on the trails by the Igorots or others in Nueva Vizcaya or other sections. They are terrorized into obedience and sold to the farmers in the Cagayan Valley at from ₱200 to ₱500, according to age, size, and desirability.

CALINGA DEPREDACTIONS.

Frequent trips by the constabulary to the Calinga rancherias of Pulay, Abug, Dalig, Cabanatuan, Camarag, Tabue, and many others has won their confidence and there are fewer cases of killing of Christians than formerly. The reported murder of a Christian of Santa Maria November 19 by Calingas was only a presumption. Lieutenant Whitaker, who made the investigation, could not discover the perpetrators of the crime or fix it for a certainty on the Calingas.

THE CONSTABULARY.

Capt. J. Y. Mason Blunt, who made an inspection at Ilagan per request of the chief supply officer, said in his report:

"The barracks, storehouses, offices, and quarters, as well as the grounds and yards pertaining to them, were clean and well kept. The personal appearance of the troops, both on duty and such as I met in the town, was smart and neat and very creditable to the commanding officer."

The district director's inspection confirms the above report.

The Second Company at Echague, commanded by Lieutenant Hanlon, a recently appointed officer, bore traces of much patrol duty, and having just emerged from the ruins of a baguio, was creditable to the company commander. Lieutenant Hanlon gives promise of making a very satisfactory officer. His quiet dignity has won him the respect of the Echague section of the province. It was noted that his library comprised scientific works, law books, and treatises on military subjects, instead of the latest fiction.

THE SCHOOLS.

Supt. H. M. Wagenblass, hard-working and resourceful, is prepared to cooperate with the constabulary and place a school at Mayayao when a cuartel and detachment is stationed there. Isabela, under Governor Curry and his worthy successor, Blas Villamor, has forged ahead in school interests.

In addition to the superintendent there are 3 American supervising teachers, 4 American teachers in provincial schools, and 60 Filipino municipal teachers, making in all a total of 67 teachers.

During the past year 8 new school buildings have been built and 14 have been started but not completed. In addition to this money has been appropriated for 15 more barrio school buildings, which will make in all 45 new buildings when completed. During the month of April a contract was placed for the construction of the new provincial schoolhouse, which will be completed on or about December, 1906.

The highest grade in the provincial school is the sixth agricultural and manual training work.

The attendance of both provincial and municipal schools have increased during the past year. The average attendance of the provincial school during the year was 152 pupils. The average attendance in the municipal schools was 2,652.

SQUATTERS EVICTED.

A tract of land containing over 4,000 hectares, in the jurisdiction of Cauayan, known as the hacienda of San Luis, which has been in litigation for the past five years, was disposed of in October and the Tabacalera Company was placed in possession of same. The inhabitants, numbering about one hundred families, were ejected from the premises by Sheriff Governor Villamor. The people offered no resistance, and the Tabacalera Company placed over a hundred carabaos and carts at their disposal, free of charge, to transport their products and personal effects off the estate. The displacing of the squatters has caused some little feeling in that section, but as a precaution a small detachment of constabulary has been kept there at all times since the order of ejection was executed. The people behaved excellently, as they made no demonstrations against the Tabacalera Company, nor have they given the company any trouble since they left the lands in question.

ESTABLISHMENT OF TOWNSHIPS.

During the month of February a township of Calingas was established at San Mariano. One hundred and fifty Calingas have taken the oath of allegiance, and three of this number have entered the municipal school at Ilagan for the purpose of learning English.

On February 21 Lieutenant Hanlon and 12 soldiers were detailed to escort Governor Villamor, of Isabela, to Lubuagan, Abra, passing Tumawini, Ginnabal, Santo Tomas, Santa Maria, Tabug, Nannung, and a Calinga rancho, half a day's march from the last-named barrio. The trip into the Calinga country was successful in every way, the Calingas showing every hospitality to both the governor and the soldiers.

A guard of 1 sergeant and 7 privates left Echague on the 12th of March to protect a body of Igorots from Mayoyao, who had arranged with Cap-

tain Owen, through their commissioner, to clean the trail from near Ascaris to Mayoyao, in anticipation of the expected visit of Commissioner Worcester to their parts. This work was successfully carried through.

On March 7, 51 Calingas, residents of the ranches of Abug, Piat, Camarag, and Cabanatuan (Sili), took their oaths of allegiance to the United States Government and have agreed to unite under one head with the tribunal at Cabanatuan. They will be established into a provisional township. On the same date 43 Calingas of the ranches Dalig, Pulay, Balanago, and Culinan also took oaths of allegiance to the Government. On or about the 15th of March the barrio of Palanan and its several ranches was made a separate municipality.

A SUPERIOR CROP.

The inhabitants throughout the southern part of the province have gathered their crops of tobacco, which is very much superior and larger than the crop of the preceding year. The tobacco of the northern part of the province was somewhat behind in its growth, owing to the fact that the first planting was entirely destroyed by the inundation on December 19, 1905. However, the second planting received an abundance of rain and it is equally as good as that of the southern half of the province.

IMPORTANT ESCORT.

The honorable the secretary of the interior was escorted from Ilagan, starting April 6 en route for Banaue, Nueva Vizcaya, by Lieutenant Hanlon. The escort proceeded by the way of the Mayat River to the Mayayao, whence the Commissioner took up the mountain trail to Banaue. The rancherias received the Commissioner with many evidences of friendship. The trail, generally speaking, is a very good one and enabled the party to take ponies and pack ponies all the way to the first ranch of Mayayao without any great difficulty. However, in many places, the trail was too steep to ride and in a few places a bit dangerous for ponies to walk, but, on the whole, the trail was very satisfactory, considering the fact that little or no repairs had been made to same for several years. This trail was that over which Senor Aguinaldo made his descent on horse from Mayayao to Oscaras when en route to Palanan. After leaving the Mayat River the trail passes through foothills for about 4 miles, then proceeds along the ridges of small mountains for a distance of 4 or 5 miles, then it passes along the ridge of a mountain about 1,500 feet in elevation, then down into a valley at a point where two large streams unite. From this point the trail ascends again and passes along the ridge of a second mountain, and at its highest point reaches an elevation of about 3,000 feet, then with a gradual descent it passes down the ridge to a point near the Mayayao River, where the trail becomes very steep for a distance of about 1,000 yards.

THE VICES.

Generally speaking there is little or no gambling in the province of Isabela. During the year 1905 some gambling was reported in the pueblo of Echague. The municipal authorities have virtually put an end to the practice, and the pueblo is now virtually free from that vice. With this exception there have been no signs or reports of gambling in the balance of the pueblos.

Cockfighting is licensed and carried on by Filipinos in all the pueblos of the province. However, Isabela has less cockfighting than the provinces inhabited by Tagalogs.

The greatest curse that Isabela has is that of opium smoking. Nearly two-thirds of the natives of the pueblo of Echague are slaves to this habit. The pueblos of Cauayan and Ilagan also have a large number of opium smokers.

IMPORTANT LADRONE CAUGHT.

In January Carlos Millillin, a noted carabao and horse ladrone, was captured by the Second Company in the ranch Banquero, jurisdiction of Cauayan. Millillin has had no fixed residence for several years, but has been operating in Cagayan and Isabela as the leader of a combination of thieves.^a

^a Information under the following headings accompanying this report is on file in the War Department: Police force, Buildings, Transportation, A soldier's detective work, Disease.

LA UNION.

In La Union there is nothing in the nature of organization either in revolutionary ladrone bands or in other guises against the government. There is, however, a state of intense political agitation, with much discord and organized lawlessness in the province. Only an active and strong senior inspector can cope with the situation. He can also restore harmonious relations between insular and provincial authorities and put conditions to what they were in the days of the lamented Captain Lovejoy. Unfortunately the numerous changes in officers has allowed the province to get from under constabulary control. At this time La Union stands in need of a severe policing. Lieutenant Knust, the supply officer, a young man who was the only American officer in the province for several months, was without previous training as a commanding officer, and was not equal to the task of covering the province in addition to the task of running his commissary and the home station. When he came into the province the northern end of his jurisdiction was in the hands of a band of grafters, comprising several officials of Bangar and Balloan, with Tomas Lopez, Governor Luna's inspector of police, as chief of operations. Complaints from Igorots had reached the honorable secretary of the interior, and action was necessary. Governor Luna's investigation did not investigate. Strenuous measures had to be taken. Lieutenant Knust entered upon the work of ferreting out the grafters, and was assisted by an operator from the division of information. The arrest of the presidente interino and secretary of Bangar and an official of Balloan was interpreted by Governor Luna to be a political movement in the interests of his rivals and persecution of the friends who were working for his reelection. The governor's conclusions were without premises. He was simply unfortunate in having a lot of grafters and extortioners for political friends. Lieutenant Knust, by direction of the district director, made investigation, arrested Lopez and other Bangar and Balloan officials, and marshaled half a hundred witnesses. The high waters in August prevented the cases from coming to trial. Meanwhile the governor made numerous complaints against Lieutenant Knust's administration. In a spirit of pique he did not suspend Tomas Lopez when that official had been charged with numerous crimes before the justice of the peace, but permitted him to continue to serve as a general police inspector, and naturally wielded a great influence against the government's investigations into the grafting. At the February term Lopez was brought to trial before Judge McCabe, convicted, and sentenced to three years and eight months for prostitution of authority and robbing Igorots of their animals. The other cases against Lopez and his fellow grafters were continued to the August term of court. By the governor's enmity toward Lieutenant Knust he unwittingly encouraged the grafters. Many good men who were friends of Governor Luna, who has a strong personality, also misjudged the motives of the constabulary in the matter. Busy bodies, unfortunately Americans, carried news between Lieutenant Knust, who may not at all times have been prudent in expressing himself, and the governor was ever a willing listener. The presence of Captain Cofren in September and November contributed somewhat toward harmonizing relations, but being new to the province, and, furthermore, in poor health, valuable time was lost. Captain Collett, who succeeded Captain Cofren, while himself confined to his quarters or the town of San Fernando by an ulcerated knee, could not correct conditions to a satisfactory extent, although he did keep patrols busy, both north and south, and with some excellent results.

BANDS OF LADRONES.

Coincident with the operations of grafters in the northern part was a band of eight or ten ladrones. There are many indications that Tomas Lopez, inspector of police, was the ringleader of that band. Every robbery perpetrated by that band showed the presence of two Tagalogs—one answerable to Lopez's appearance in every respect. It was also quite significant that the band had with it in all its operations two revolvers similar to those in the hands of the police of Bangar. Since Lopez's conviction the member of the band of his description with police revolver is not present with the band. This organization robbed a house in a barrio of Namacapan in November of ₱200; in September they robbed and beat up the justice of the peace in Bacnotan, compelling him to give up ₱500. The robbing of a township treasurer and the holding up and robbing of a Chinese merchant on the highway in the vicinity of Namacapan are among the records of this band. Investigation shows conclusively that it is a local organization and mobilizes in the vicinity of Bangar or Balloan.

The southern band is also a local organization and comprises elements of Rosario and vicinity. Their latest assault in June was in a barrio of Bauang, in which they seriously wounded a citizen of Banaue, whom they attempted to rob. Their victim succeeded in wresting a bolo from one of his assailants and inflicted such injuries upon them that they fled. An astute constabulary officer in Union would clean up these bands, as they are very crude in their work.

The police force in Aringay in December captured two highwaymen who had robbed a merchant in the highway at Cava of ₱70, and they await trial.

Captain Collett in February took up the matter of the binding and robbery of seven Igorots, and wounding of another of the party, all of Baguio, in the barrio of Gosing, Naguillan. He captured the entire band, and they are now charged with "robo en cuadrille."

The murder of a young woman near Bacnotan in February remains a mystery.

The murderer of Eugenio Eisma, and who at the same time seriously wounded his wife, Maria Escobar, at Santo Tomas in February, awaits trial.

The burning of the house of the presidente of Agoo is believed to have been due to an intense local political fight. It will be something short of marvelous if the present contest between the adherents of the candidates for governor does not result in violence, as the feeling is intensely bitter, and threats have been bandied in several quarters. Any act contrary to law could, however, not be attributed to suggestion on the part of any of the candidates, as they are honorable men and are strong advocates of good order.

THE CONSTABULARY.

The enlisted strength of La Union comprises the best of the old organization. A liberal percentage of the men speak English and all have a working knowledge of Spanish. In the matter of drill and discipline they are better than could be expected, with so many changes of officers. The detachment on duty at Camp Four, commanded by Subinspector Hombrebueno, performed their duties exceptionally well, and in addition to many patrols and guarding of Benguet road powder house observed the regular routine of drills and rivaled Lieutenant Diederich's spick and span Igorots in care and condition of equipment. The detachment at Alilem has sustained Lieutenant-Governor Hale in carrying out his paternal form of government among the Igorots and are much respected by the Amburayan primitives.

THE SCHOOLS.

The walls of the new high school building south of the main part of the town are well up. The building will cost ₱12,000 and will occupy land contributed by Dr. Lucio Almeida and others. The superintendent of public instruction, as well as the entire corps of teachers, are enthusiastic admirers of Governor Luna, on account of his untiring efforts in behalf of improved buildings, good attendance, and discipline in all parts of the province.

The schools in Amburayan have been under the authority of the La Union superintendent, and a trades school is now in successful operation at Alilem. The teacher, Mr. Allen, has had a surprising success with the Igorots, to the extent that the rancherias are sending their brightest girls as well as boys to school in Alilem.

THE ROADS.

The provincial authorities have gone a long way toward redeeming their main highway. A ₱6,000 bridge over the river at Carlatan is among the most important of the new bridges recently erected. Superintendent Hess has been rebuilding and repairing those south of San Fernando.

RELIGIOUS MOVEMENT.

The independent church has an organization in San Gabriel, of San Juan, at Carlatan and Aringay. There is no public agitation over the subject of religion in La Union. The Protestant missionaries of the United Brethren Order have put up buildings in San Fernando and seem to be prosperous. The Christians and Methodists also have a large following in the northern end of the province. There is, however, no bitterness manifested by the schismatics toward one another. The Guardia de Honor has several branches in La Union, but the worthlessness of the adherents of that faith have made themselves in the past a mark for Governor Luna's disfavor, and many of them have gone

to more congenial jurisdictions. It is one of Governor Luna's strong points, that of making a thorny path for lazy and shiftless people. His influence accounts for the thrift and continuous planting of trees and new crops, as well as clean and sanitary conditions in a large number of the pueblos of La Union.

THE CROPS.

Both rice and tobacco were light crops, owing to a lack of rain. The rice was also attacked by a worm which destroyed a part of it. It became necessary to plant two or three times.

The new acreage of magney is a feature of the province. The leading planter is the enterprising and splendid friend of the government, Doctor Almeida, of San Fernando. Adding modern machinery himself to his vast hacienda, he encourages the rich and poor to utilize every available nook and hillside, making donations of plants to his less-favored countrymen.^a

LEPANTO-BONTOC.

During the year there have been many changes in the constabulary. Supply Officer W. D. Harris, who was the only real officer in the province, struggled along after Captain Nathorst went to Cavite until Captain Eckman relieved him in October. Lieutenant Harris, by reason of his multiplicity of duties and construction of cuartels and officers' quarters at Balbalasan, Lubuagan, and Cervantes, expeditions, etc., became almost hopelessly involved, and later was relieved as a supply officer and transferred to the line. He is now in command of the Second Company and is stationed in Lubuagan. His station is a model in quality, appearance, comfort, and discipline. His substation, Balbalasan, has just been completed and is now ably commanded by Subinspector Balajadia, a worthy graduate of the St. Louis Battalion and constabulary school. Lieut. H. E. Miller, who had been in command at Lubuagan, resigned in July to go into private business and is now in Pingad planting coffee. Subinspector Robles resigned in December to make room for good material. Lieutenant Durkes, who came in July, was eventually returned to the constabulary school for instruction. Lieutenant Manning, the supply officer, is recuperating from a serious sickness and makes a very acceptable detachment commander at Cervantes.

The rank and file of the Lepanto-Bontoc constabulary are soldiers.

The compliment of the honorable the secretary of commerce and police, referring to service in Cavite, to wit, "It is desired to compliment the Igorot constabulary on their fine work," might be repeated as to their conduct and work at home. The companies are filled and former members stand ready to fill prospective vacancies. Just as soon as an Igorot soldier of the constabulary leaves the service his rancheria elect him presidente, because of his experience and education. Many of the Igorots speak English in a very satisfactory manner.

HEAD-HUNTING ABATED.

It is with feelings of exultation to record that there have been no actual war parties out or head taking during the year. The murder of a 12-year old boy at Puspus, Bontoc, by two men of Tucucan came nigh sending Bontoc and Samoqui against Tucucan, but Captain Nathorst, by sheer force of personality, turned the armed hosts of those irate rancherias back to their homes with an abiding faith that justice would be done in the courts.

During the early part of June two men of Barlig, while at Cambulo in Nueva Vizcaya, were killed by the people of Talfiac, Nueva Vizcaya, enemies of Cambulo. The matter is under investigation. This incident again suggests the wisdom of placing the entire Banaue and Quilangan section of Nueva Vizcaya under the constabulary jurisdiction of Lepanto-Bontoc. The trade relations between Banaue and Lepanto-Bontoc requires for the maintenance of peace a strong surveillance of the territory intervening between Bontoc and Banaue.

PEACEMAKING.

The constabulary peacemakers, whose work was begun by Captain Nathorst three years ago, have had excellent results attained, and Igorots of Banaue, Talubin, Barlig, Lias, and scores of rancherias who dared not venture beyond their own limits three years ago now travel through Lepanto and Bontoc, going

^a Informaton under the following headings accompanying this report is on file in the War Department: Stations; charged with murder.

as far as the coast and return without being molested. During the past five months the peacemakings have been: Talubin with Samoqui, January 7; Lias with Lubuagan, February 15; Bontoc with Balioang, April 2; Sabangan with Talubin, May 29. By agreement with the Igorots the district director sends herewith the originally signed documents, a copy of which is in the hands of each interested rancheria.

Talubin-Samoqui.

To all whom these presents shall come, greeting:

On the seventh day of January, in the year of our Lord one thousand nine hundred and six, before me appeared the undersigned representatives of the rancherias of Talubin and Samoqui, subprovince of Bontoc, Lepanto-Bontoc, and avowed that it was their intention and resolution that, in my presence, according to their own ancient custom, forever bury any hatred and any feud there may have existed between their rancherias in the past and hereby make everlasting peace. Accordingly, the undersigned, representing the American Government, took from Gatunen, the presidente of Samoqui, his silver-headed walking cane and presenting it to Maclein, the most influential man of Talubin, said:

"Maclein, I present to you the cane of Presidente Gatunen, of Samoqui, as a token of that rancheria's everlasting friendship. Accept it as such and inform your people of this peacemaking, so that none may ever dare to injure man, woman, or child that from Samoqui may for some reason or other come in close proximity of your rancheria."

Likewise Maclein's cane was presented to Presidente Gatunen, and all present expressed themselves pleased and agreed to abide by the above peacemaking.

Presidente Gatunen and Maclein changed names and the former will hereafter be known as Maclein and the latter as Gatunen among their Igorot brethren.

Those present were: Representing Talubin, Maclein; Kana-kak, presidente; Tugasak, vice-presidente; Talangen. Representing Samoqui, Gatunen, presidente; Captain Fotadsa (past presidente); Bisuy; Chaul; Caue; Cumpala.

Witness: Sergeant Simon Coronel, Philippine Constabulary.

To which I have this date of our Lord set my hand and seal at Bontoc, Lepanto-Bontoc, Jan. 7, 1906.

[SEAL U. S.]

C. E. NATHORST,
Senior Inspector, Constabulary,
Lepanto-Bontoc.

Talubin-Sabangan.

To all whom these presents shall come, greeting:

On the twenty-ninth day of May, in the year of our Lord one thousand nine hundred and six, in the presidencia of Sabangan, Lepanto-Bontoc, appeared before the undersigned certain representatives of the rancherias of Talubin and Sabangan, Lepanto-Bontoc, declaring and avowing their intention to forever bury any hatred and old feud that may have existed between their rancherias in the past and hereby declare and make everlasting peace.

Capt. Bernandino Bondad, of Sabangan, presented what pertained to be an old peacemaking between the aforesaid rancherias and executed in the presence of a Mr. Morely, but Bondad declared that as the peacemaking had not heretofore been made in presence of government officials it was of no value.

Maclein, of Talubin, spoke for his rancheria and said: "I want two or three from Sabangan to accompany us home and I desire to show you that we are your friends by treating you well. You do not need be afraid of my people, for before I would permit any of them to hurt you they would have to kill me."

Both Maj. S. D. Crawford and Capt. C. E. Nathorst spoke in behalf of the Government and for peace, warning them that if this contract was broken the constabulary would have to punish them.

That this contract shall not be violated or broken by any of the aforesaid rancherias, we, the undersigned, have hereto affixed our signatures this 29th day of May, 1906.

Representing Talubin: Daclisen (mark), presidente; Gullad (mark), vice-presidente; Maclein (mark). Representing Sabangan: Eusebio Gouason, presidente; Dongino (mark), consejal; Bernandino Bondad, captain; Tinipao (mark), captain.

Witnesses to the above: C. E. Nathorst, Harry E. Miller, representing the American Government; Samuel D. Crawford, major and district director, Philippine Constabulary; C. E. Nathorst, senior inspector, Lepanto-Bontoc.

Talubin-Pingad.

To all whom these presents shall come, greeting:

On the twenty-ninth day of May, in the year of our Lord one thousand nine hundred and six, in the house of Florencio Barreras, municipal secretary and treasurer, residing in the barrio of Pingad, township of Sabangan, Lepanto-Bontoc, appeared before the undersigned certain representatives of the rancherias of Talubin and Pingad, Lepanto-Bontoc, avowing their intention to forever bury any hatred or old feud that may have heretofore existed between their rancherias and hereby declare and make everlasting peace.

Captain Taya spoke for Pingad, stating it was a pleasure for him and his people to make this peace, as they desired above all things to obey and abide by the laws of the Government.

Maclein, of Tabulin, spoke for his rancheria, inviting any and all the people of Pingad to come over and visit his town, where they would be welcome and well treated.

Maj. S. D. Crawford and Capt. C. E. Nathorst spoke in behalf of the Government and peace, warning the people to abide by this peacemaking.

May 30 all the principal people of Pingad, Sabangan, and Tabulin met at Sabangan, ate and drank together, and expressed themselves please with the peacemaking.

That this agreement shall not be violated by any of the aforesaid rancherias, we, the undersigned, have hereto this date, May 29, 1906, affixed our signatures.

Representing Talubin: Daclisen (mark), presidente; Guilad (mark), vice-presidente; Macelin (mark). Representing Pingad: Agustin (mark), secretary and treasurer; Pagado (mark), consejal; Dagioa (mark), captain; Mandiit (mark); Mangapan (mark); Harry E. Miller, Tayyo (mark); Guduen (mark).

Witnesses to the above: C. E. Nathorst, Harry E. Miller, representing the American Government; Samuel D. Crawford, major and district director, Philippine Constabulary; C. E. Nathorst, senior inspector, Lepanto-Bontoc.

Balioang-Bontoc.

To all whom these presents shall come, greeting:

On the second day of April, in the year of our Lord one thousand nine hundred and six, before me appeared the undersigned representatives of the rancherias of Bontoc and Balioang, subprovince of Bontoc, Lepanto-Bontoc, declaring that it was their intention and resolution, and in my presence, according to their ancient custom make peace, exchange presents, and forever bury any hatred or old feud that may have existed between the two rancherias in the past, and hereby make everlasting peace.

Therefore Dup-dupen, of Bontoc, handed a breech-clout ("G" string) to Mangaoyaen, of Balioang, as a token of everlasting friendship and peace. Mangaoyaen, likewise in behalf of Balioang, returned the present with a similar one from Balioang, assuring the Bontoc people that they were forever their friends.

The senior inspector also addressed the people, warning them to abide by this, their own peacemaking.

To which I have this date of our Lord set my hand and seal. Bontoc, April 2, 1906.

[SEAL, U. S.]

C. E. NATHORST,

Senior Inspector, Constabulary, Lepanto-Bontoc.

Those present were: Representing Balioang: Mangaoyaen; Ad-chan, vice-presidente; A-jac; Ping-yan. Representing Bontoc: Galaling, presidente; Dup-dupen, captain; Agustin Balisoa, captain.

The abandonment of ancient feuds and peacemaking has had a splendid result, as may be seen by the extent of new sementeres at Bangad and other rancherias formerly in fear of Lubuagan, at Mangali in the Tolocot River Valley, as well as in the Talubin zone. The effect is also felt by storekeepers, whose sales to Igorots are constantly mounting up by reason of the free inter-rancheria travel.

RELIGIOUS MOVEMENTS.

During the year there has been considerable work among the Igorots along religious lines. During the month of June large delegations from Lepanto-Bontoc and Nueva Vizcaya went to Narvacan, in Ilocos Sur, for baptism and were received into the Aglipayano or independent church by the Maximo in

person. The rancherias represented were Cayan, Sabangan, Tadian, Panian, Basao, Pidluan, Ginsadan, Lapong, Pilipil, Dataa, Agaa, Bangnug, Angaqui, Ambague, Cagubtan, Mabaliti, Samaday, Boemic, Pandain, Masla, Nagbuquel, Banaue, Ambubutan, Namitpit, Balili, Sabian, Laylaya, and a few more rancherias, and all number 660 men, women, and children, according to the fiscal books. Sagada, the center of the religious movement, sent 50 to the independent fold. The converts came in bands of fifty to a hundred, without aliwas or spears. At the conclusion of the religious ceremonies a procession of the converts paraded the streets of Narvican in a very quiet and orderly manner. The Igorots were quartered in the building used by the Partido Republicano in Narvican.

The Guardia de Honor grows in numbers in southern Bontoc and Lepanto. The Sapoladas, or Vegetarians, are numerous in the vicinity of Sagada and Bagnan. It is reported that something over 300 Igorots have joined the Episcopal mission at Sagada, where a new church is under way. Another new Episcopal mission building is under roof on the mountain dividing Bagnan. At Bontoc the religious movement is confined entirely to the Episcopal mission, presided over by Rev. Dr. Clapp, with Rev. and Mrs. Spencer, teacher McKenzie, Misses Oaks and Waterman. Miss Oaks, to whom the constabulary is under so many and continuous obligations for free treatment of the soldiers, conducts a free clinic and treats thousands of Igorots. This noble woman is much revered by the primitive people.

NEW INDUSTRIES.

The Episcopal mission has installed a sawmill at Fedilisan, a rancheria about 6 miles northwest of Sagada. The motive power is an immense and never-failing waterfall and turbine wheel. Primarily, the product is to be used for the new church, new hospital, and school at Bontoc, and the missions at Sagada and Bagnan. Afterwards the product of the mill will be sold and many new buildings, of which there is so much lack in Bontoc, are in prospect. A shingle mill will be added to the plant later.

DISEASES.

Smallpox appeared in Suyoc in July and August, and about 30 deaths occurred. The disease spread into Moncayan in November, and something like 14 deaths occurred out of 35 cases. The constabulary quarantine confined the disease to Suyoc and Moncayan.

The only animal disease recorded during the year was in Sadanga in November. Mr. Worcester, of the bureau of agriculture, with constabulary escort, attended. Just at that time the Igorots were in rebellion against the authority of the then lieutenant-governor, Folkmar, and refused to burn their dead animals, but disposed of the cadavers for food and then ran their animals off into secluded places. This conduct handicapped Mr. Worcester to such an extent that he gave up the work. Since then, and under Captain Eckman's wise administration, the Igorots are responsive to the orders of the authorities.

NEW BUILDINGS.

The building erected at Cervantes by Lieutenant Harris, as well as the cuartel now nearing completion, have been constructed in the main by the enlisted men. With the limited appropriation for buildings in Lepanto-Bontoc it became necessary to summon every resource in labor and material to secure the desired results. Lieutenant Harris had a fund of ₱1,500, which he received from the sale of old quarters which had also been constructed by enlisted men's labor principally, and originally ₱600 allowance by the chief supply officer. Lieutenant Harris, a carpenter himself, trained a number of the men to use tools, while others were laborers. An old building at Midpit furnished the most of the siding and flooring for the first building now used for supply office, commissary, and quartermaster's stores and men's quarters. The men's quarters, located on close-by grounds graded by the men, constructed of splendid material, with board floor, is nearing completion, and when furnished will be occupied by the enlisted men. This will enable the supply officer and commanding officer at Cervantes to finish living quarters in the first building and thereby cut out quarters allowances at Cervantes. The imposition of the labor referred to cost the constabulary several reenlistments, but it trained a number of men for usefulness in civil life, and saved the government much expense.

Under ordinary procedure these buildings at Cervantes alone would have cost the government not less than ₱2,500 and possibly ₱3,000. At Labuagan Lieutenant Harris, working from his original capital of ₱2,100 and later allowances of ₱500, erected a modern five-room, hard-wood house, with cogon roof and cuartel, built on an elevated stone foundation, of hard wood, capacity for fifty men, with office and storeroom, and of splendid design for comfort of the men and security in case of an attack. These buildings built on contract would have cost not less than ₱3,000. In the meantime Lieutenant Harris had the Balbalasan officers' quarters and cuartel under way, working from the same fund of ₱2,100. These buildings, worth not less than ₱3,000, are completed. It will be observed that the original fund of ₱1,500, from sale of old cuartel in Cervantes, augmented by about ₱1,100 by the chief supply officer, through Lieutenant Harris's indefatigable industry, ingenuity and carpenter skill, and the industry and utility of enlisted men, as well as the good will, free material, and contributed labor on the part of the Igorots at Labuagan and Balbalasan, has given the constabulary buildings worth between ₱8,000 and ₱9,000. It should be added here that Lubuagan, rich, powerful, aggressive, overbearing, and cruel in its relations with weaker rancherias, and originally not caring for a constabulary detachment in their rancheria, yielded so gracefully to the influence of constabulary officials that they freely gave a most eligible site and then, after contributing valuable material and labor, seeing the model structure completed with surroundings, became so enthusiastic that they insisted that the constabulary must accept more ground, adding a generous slice. Still not satisfied, the chief men of Lubuagan said to show their further appreciation of the money spent in the rancheria by the constabulary for material, they turned out en masse and built a 5-foot stone wall around the constabulary grounds to mark the boundary. Balbalasan was no less generous in its contribution of men, material, and ground to furnish the buildings and environments desired by Lieutenant Harris. Lubuagan had caught the idea of making its rancheria a government center, with attendant political influences, not to speak of commercial advantages, and Balbalasan, the home of the first and most skillful artisans in iron and steel in the Igorot belt, wanted protection against hostile alzados, but both had other aspirations. They want schools with American teachers, and their importunities are so sincere and persistent that it is a source of grief that the department of education can not see its way clear to help these most worthy and deserving people. Both Lubuagan and Balbalasan would certainly be as generous with the school department as they have been with the constabulary. Detachments from Lubuagan to meet the patrols from Bontoc once a week is the signal for enormous trading parties, men and women, to and from Lubuagan and intermediate rancherias. The same is true of the patrols to and from Balbalasan. The constabulary has opened up the entire country, enabling rancherias, regardless of strength or influence, to travel and exchange products over a section of 80 miles hitherto hostile and the scenes of frequent war expeditions.

The old guardia civil building at Bontoc has been repaired at an expenditure, and a new roof, new floors, a kitchen, and dining room added. A guardhouse separate from the building has been erected. A very comfortable stable has been built by Captain Nathorst without further expense to the government. All that is needed now at Bontoc is a house with offices for the senior inspector, and Lepanto-Bontoc constabulary will live in its own house, and all rents will stop.

A NEW STATION.

Captain Nathorst, while on an extended expedition in the Mangali country in February and March, covered the Talodan River rancherias, of which six alone belong to Mangali. This section of country comprises Barlig and Lias, as well as Tolocotoc. It also comprises Lubo, Gaan, and Ibajan, rendered hostile by ex-Lieutenant-Governor Folkmar's destruction by fire of Gaan less than two years ago. The attack by the Lieutenant-Governor Folkmar on the rancherias in the Mangali country had also badly affected the rancherias to the eastward of Tolocotoc. Many of these ran away from the district director a year ago, and it was then out of the question to affect a reconciliation. In March Captain Nathorst, through the medium of friendly rancherias, got into conference with Lubo, Gaan, and Ibajan and patched up a peace with them. He organized the rancherias and appointed officers, which was afterwards ratified by the lieutenant-governor. Peace has recently been established between Lubo, Gaan, and Ibajan on one side and Mangali on the other. The country is too

large and too far away to be successfully handled from Lubuagan. It is the widest and richest valley in the entire Bontoc country. It is also through this section that the road from Abra, Balbalasan, and Lubuagan will pass to Nanon and thence to Santa Maria, Isabela Province. The honorable secretary of the interior desires to open up the old Spanish trail in Abra to connect with that already opened between Balbalasan and Lubuagan. When opened through to Santa Maria, Isabela, the trip can be made by horse in from five to seven days in the dry season. It is now desired to establish a post at Mangali for the purpose of preserving peace and the good relations established by Captain Nathorst. This post will also control and preserve tranquillity in the Balaoan, Cadacalan, and Madacayan country, in which the district director made peace in June, 1905. It is proposed to garrison the Mangali country with the Balbalasan detachment as soon as the Second Company of Ilocos Sur returns from Bulacan Province. Lieutenant Rowell's Third Company will furnish the detachment from Balbalasan and gain a splendid advantage in protecting Abra from the Alzados. This station is a day's march from Sapid, Abra's farthest eastern station, and is but two days from Bangued, whereas Balbalasan is a day and a half from Lubuagan and three days and a half from Bontoc. This change will give Captain Nathorst the relief or rather the additional troops necessary for covering his most delicate country. Steps will be taken toward the establishment of the new station at the close of the rainy season. The new station will render that contemplated at Balangao unnecessary and will make a fine strategic disposition of the Bontoc forces. Captain Nathorst is very anxious to establish the Mangali station, and as the district director is familiar with the country east, west, north, and south of Mangali, with all its ramifications, he is in perfect accord with the captain's suggestions. This is another step toward getting the most service out of the available forces in this district, as well as to extend the positive zone of influence for peacemaking, with all its attendant blessings.

THE HIGHWAYS.

The provincial authorities have made extensive repairs on the trails. The new road between Cervantes and Tagadin had progressed as far as Malaya in January, and since then it was pushed within sight of Tagadin. As soon as two small bridges are put in the mountains at Malaya a cart may be driven over the trail, which at no place will be over a 6 per cent grade. As soon as the contemplated transfer of Tagadin from Ilocos Sur to Lepanto-Bontoc is made the new road will be completed. This done there will be but one river to cross between Cervantes and the seacoast, instead of as now the Abra and its tributaries to Tilod, and then that between Concepcion and Salcedo, thirteen times, either hazardous or an impossibility in the rainy season. The old trail from Candon to Cervantes is 47 hard miles in length; that from Cervantes to Tagadin will be about 25 miles, or a day's easy travel. The new trail is already open for cargadores. At the present time constabulary supplies are delivered from ship's side to Cervantes at 4 cents per pound, guaranteed—a very reasonable figure. By the new Tagadin road that figure can be reduced one-half. The trail between Cervantes and Bontoc has been made much easier for horses, and a change in the lower trail after the first Chico River crossing south of Bontoc will render the lower trail preferable and shorter between Bontoc and Cervantes in the dry season.

The trail from Bontoc has been opened to Lubuagan, relieving the traveler from the necessity of making two or three crossings of the Chico at Tinglongan and Mabontot, an impossibility in the rainy season. The old trail has been opened this season from Lubuagan to Balbalasan, and is safe for horses, although many repairs will be necessary after the rainy season. It now remains for Ilocos Sur and Abra to open the old Spanish trail from near Bucay, Abra to Balbalasan, and the Ilocos country will have free, safe, and easy access, after the Nanon-Santa Maria-Isabela trail is built, to the traffic of the Cagayan Valley. The constabulary patrols between San Jose and Sapid and Balbalasan, Balbalasan and Lubuagan, and later between Lubuagan and Mangali will render travel for either Igorot or Christian across the Cordillera into the Cagayan Valley entirely safe from predatory Alzado attacks, and the question of Iadrones is to be considered, because there are none in the zone to be traversed. Many side trails are being cleared and rebuilt, notably that leading from Bontoc via Samouqui to Talubin. The rancherias off the main trails have also cleared and repaired their trails, as if inviting travel to their domains. The master spirit in all these improvements is Supervisor Kane, an old resident, a successful

coffee grower, and representative business man. With the ample labor and means under the new law, Lepanto-Bontoc will be uncorked, and in another year profitable pack-train enterprises will tread the mountains of Lepanto-Bontoc, and her resources will command the respect of commerciantes.

Governor Reed, whose administration has been so able and conscientious, goes to the States on his vacation. His potent influence is felt in all parts of his province.

THE CROPS.

The general peaceful conditions and security on the trail and in the sementerias from lurking alzado seeking a head with which to appease the bad anitos yielded returns in rich abundance. The increased acreage in newly made or reclaimed sementerias were all blessed with an unusually good crop of rice this year. The Igorots are diversifying their crops to the extent that most all rancherias show liberal plantings of beans, corn, squash, sugar cane, and in some localities, such as Fidelisan, white potatoes of good quality. The Agricultural Department has promised the district director a supply of the common vegetable seeds in October, and these will be distributed according to suitability of locality. The simplicity of Igorot life is being disturbed and his wants extend to more clothes. This stimulates him to produce beyond the needs of his stomach. Government stores at Lubuagan, Bontoc, and Cervantes would have in a few years stimulated an outflow of food products, especially rice, corn, and potatoes, for lower-country consumption. The Igorots, in thousands of instances this year, paid their road tax in money, preferring to spend their time in work on their lands.

COFFEE PLANTING.

A great many Igorots have recovered from their aversion to coffee growing and are now planting, especially around their houses. Mr. H. E. Miller, a former constabulary officer, is planting very extensively for himself at Pingad and has contracted and is planting an extensive cafetal for another American in the same vicinity. This example has been potential, and it is safe to estimate that 100,000 young trees will be planted this season. The crop this year was a paying one and commanded good prices. Several abandoned cafetales will be reclaimed this year.

THE SCHOOLS.

A Mr. Travis has been appointed superintendent of schools in Lepanto-Bontoc and corresponding results are expected. A large trade school building has been erected on the Cayuse side of Cervantes and will now be opened. The boys' school at Bontoc has been considerable of a success, but a practical carpenter and blacksmith is needed at the school. The institution has the tools, and about 60 boys from different rancherias in the dormitory, some of them coming from Balbalasan, a distance of 80 miles.

AMBURAYAN.

The subprovince of Amburayan, Lepanto-Bontoc, has a small detachment of constabulary from La Union at the government house in Alilem. The numerous and persistent abuses by La Union officials on the Igorots called for a personal investigation on the part of the district director last August. In company with Lieutenant-Governor Hale the various rancherias of the comandancia were visited. It was then developed that officials and certain citizens of La Union had been interfering with Governor Hale's authority. They had visited his rancherias, had advised the people not to obey the governor's orders, and had gone so far as to organize rancherias, collecting assessments, etc. Another had made a collection of a peso per capita as a land tax in Culili. The visit and subsequent expeditions by the small detachment of constabulary in quest of the grafters and trouble makers restored the governor's authority. It was then observed that Governor Hale's wise administration and paternal form of government had raised the struggling half starving rancherias to conditions of plenty. In the rancherias contiguous to and lying within La Union the abuses were barefaced. Prosecutions were begun in La Union against Tomas Lopez, inspector of police in La Union, and officials in Bangar and Balaoan. These officials had been for some time engaged in seizing the carabaos and cattle of the Igorots upon the pretext that they had not been branded,

etc. The abuses were so notorious that La Union eventually lost all the rancherias, they being by an act of the Commission transferred to Amburayan. The cupidity of the La Union people cost the province some of its very best rice lands, a consideration when the land taxes are resumed. Lopez, the ring-leader, the liveried official whose capacious maw had swallowed up scores of animals, was sentenced to a term of three years and eight months on one charge, and is now in Bilibid. There are half a dozen other charges against him. The remaining cases will be tried in August. Lopez is a brother-in-law of Montalon, of Cavite, and was himself an insurrecto officer in Cavite.

Very respectfully,

SAMUEL D. CRAWFORD,
District Director.

The EXECUTIVE INSPECTOR,

Bureau of Constabulary, Manila, P. I.

NOTE: Information under the following headings accompanying this report is on file in the War Department: Stations, suicides, mess savings, reduction in rents, recommendations, tables showing number of arms captured, animals recovered, expeditions and engagements, miles covered, constabulary and outlaws killed and wounded, etc.

APPENDIX 5.

REPORT OF DISTRICT DIRECTOR, FIFTH DISTRICT, BUREAU OF CONSTABULARY.

HEADQUARTERS FIFTH DISTRICT, BUREAU OF CONSTABULARY.

Zamboanga, P. I., August 1, 1906.

SIR: I have the honor to submit this, the third annual report of constabulary operations, progress, and conditions in this district for the year ending July 31, 1906.

The district was commanded by Col. J. G. Harbord from July 1, 1903, to October 22, 1905, and since the latter date by myself, under provisions of General Orders, No. 79, Headquarters, Bureau of Constabulary, September 15, 1905.

I have visited all stations in the district from four to seven times, in addition to absences for field duty, a total absence from station since October 22 of one hundred and sixty-one days. I have endeavored to acquaint myself with conditions and requirements of the district.

The district consists of the following provinces and districts:

	Strength.	Station.
District:		
Cotabato	1 company	Cotabato.
Davao	2 companies	Davao and Mati.
Lanao	do	Iligan and Misamis (later detached from Misamis Province).
Sulu	do	Siasi, Bongao, and detachment at Sitanki.
Zamboanga	3 companies	Tucuran, Dapitan, Dipolog, Calarian prison, and Isabela.
Provinces:		
Surigao	1 company	Surigao and Talacogan.
Misamis	do	Cagayan (West Misamis attached to Lanao).
General service	do	Zamboanga.

The above districts constitute the Moro Province.

Since July 1, 1905, the authorized strength of the district has been reduced from 810 to 600 enlisted men. The men could ill be spared, and when a comparatively large body of constabulary has been gathered for expeditionary purposes, stations have in many cases been depleted below the safety limit.

Constabulary operations have embraced the following:

(1) Cooperation with United States troops under direct orders from the governor of the Moro Province, as at Bud Dajo, the Buldung expedition, Davao expedition, etc.

(2) Investigations, expeditions, and miscellaneous police and administrative work undertaken by officers either as deputies of district governors, on their request, or with their cognizance and approval.

(3) Independent work, of which there has been little except in Surigao and Misamis.

CONDITIONS.

Conditions generally have been satisfactory, but several occurrences have given the district wide-spread notoriety. The Moro has neither politics nor exalted ideals of independencia, but when he has a score to settle with his enemy he sharpens his campilan and cheerfully goes to his death if such be his fortune. Commercially the province has been forging steadily ahead.

In Surigao the last vestige of bandolerismo disappeared with the recent capture of the only two remaining outlaws who murdered Captain Clark. The province is progressing, and it is hoped that people seeking a suitable country for hemp will appreciate the advantages of the enormous tracts of arable land in the beautiful Agusan Valley.

In Misamis there were a few minor troubles early in the year, but conditions have improved, and in spite of antagonistic politics and religious factions there is improvement.

In Zamboanga the establishment of Moro exchanges has brought the wild mountain tribes in commercial touch with their neighbors on the coast, which has added to the prevailing peaceful conditions and has increased exports and encouraged trade and intercourse throughout the district.

In Sulu conditions are better than ever before, and peace prevails throughout the 188 islands embraced in this district. The cleaning up given the disaffected Moros on Mount Dajo has given the inhabitants of those islands food for thought, which when digested will probably prevent a recurrence of that affair. There are, however, many guns in the possession of these people which should be eventually stored in our arsenals, through peaceful means if possible, but through force if necessary.

In Cotabato the death of Ali and the surrender of some few hundred guns has left that valley peaceful. There are, however, a few dattos who will no doubt have to feel the iron hand of the law placed upon them before they will realize that the government proposes to control them. Although the district is tranquil, there are large areas of territory lying east and south of the Rio Grande and north of Pikit which are practically unexplored and where much work remains to be performed. The single company of constabulary in the district has made but small pretense of covering this country, but its activity is shown by the senior inspector's report of 32 expeditions, covering 1,544 miles, during the year.

In Lanao conditions are practically the same as in Cotabato. It is hoped that provision can be made for additional constabulary in that section in order that it can relieve the army of the police work in Lanao and Cotabato, which it is now frequently called upon to perform.

In Davao the lamentable death of Governor Bolton was a great blow to the district; with his death much valuable information pertaining to the pagan tribes in that section was lost. Additional planters have located there to engage in miscellaneous agriculture. The exports for the past year have far exceeded those of any preceding year and the future of the district seems most promising. The greatest number and variety of tribes in any part of the islands inhabit this section. Years of patient and energetic work will be required to break up slave trade and barbarous customs and to mold these people into a homogeneous community.

MUNICIPAL POLICE.

Generally they compare favorably with those of other parts of the islands, but in Malabang, Parang, Cotabato, and Zamboanga, where they have white men for chiefs, they are above the average. In Misamis they have been neatly uniformed, and in some towns materially improved.

PRISONS.

The constabulary guards the provincial jail in Surigao. Until recently it also had charge of the one in Misamis, but at present the province has its own guard.

In Davao the jail is so infected with beri-beri that prisoners are kept in the constabulary guardhouse. A period of six months confinement in the Davao jail is equivalent to a death warrant. Every effort has been made to remove the cause of infection, but without success so far.

The constabulary has entire charge of prisoners in Lanao, and they are confined in the constabulary guardhouse at Iligan.

At Calarian prison, Zamboanga, the First Company of Zamboanga is stationed.

The company commander is also warden of the prison. Upon my arrival in the district I found 18 men of the constabulary guarding this prison, containing nearly 100 prisoners; the majority of this guard being absent during the day guarding working parties and the entire detail doing duty day and night. The guarding of this prison was an arrangement agreed upon by Colonel Harbord and the provincial governor. I decided that in order to insure the proper guard and avoid some future disaster at the prison to the discredit of the constabulary a company should be assigned to this duty. In addition, this company guards the provincial treasurer's office in Zamboanga and also the provincial pesthouse near the prison when there is occasion to do so. It will be seen that this company will not be available for other duties in case of active field operations, except for limited periods.

DUTIES OF CONSTABULARY.

The constabulary of this district is, by the organic act of the Moro Province, placed under the command of the governor of the Moro Province, and it has been the policy of my predecessor, and I am making it my own, to encourage the use of the constabulary by the district governors by assisting them in the civil administration of the districts. In some instances it is being done by the district governors to the credit and experience of the constabulary officers. A strict construction of the law would probably not authorize this, but common sense and policy demands that much latitude be given and judgment exercised. There exists opportunities for friction, and no doubt instances will occur where forbearance will have to be exercised, but with districts governors and the district director a way will always be found for overcoming any difficulties.

The duties of officers are too numerous to make mention of all, but the following contemplates some of the principal ones:

Deputy governors in a section of assigned territory, judges of tribal ward courts, when approved by the provincial governor; justices of the peace, when approved by the civil governor, this function to be exercised only in localities where no other is available; deputy sheriffs under the district governors, when appointed by the same and approved by provincial governor, to make arrests, to serve warrants, to take charge of municipal affairs of any town at request of the district governor, to convene and supervise council of headmen of any district, to supervise the creation and management of Moro exchanges, etc.

Conditions vary so much in different districts that no general rule can be laid down, but such instructions are given each individual officer, with the approval of the provincial governor, as will enable him to utilize them as a general guide for his actions. In this way it can be seen that the field of usefulness of the constabulary is largely increased; that the Moro Province procures, without extra expense, the services of experienced officers, and that the constabulary renders service to the government fully commensurate with its cost. The provinces of Surigao and Misamis can not be treated in this way, and the duties of the constabulary must, under present conditions, be confined as nearly as possible strictly to the uses prescribed by the acts of the Commission.

Service of constabulary officers in the Moro Province is fitting them, particularly the senior inspectors, for valuable service to the government as governors of districts and secretaries to district governors when it becomes the policy to replace army officers now so serving. For this reason, when a constabulary officer shows energy and aptitude for this class of work he should be continued on duty in the Moro Province. The vigorous protest that is being made by the Army for the return of officers to their regiments may result sooner or later in this substitution, and if the constabulary can furnish a few valuable men familiar with the country, the dialects and customs when called upon, it will add to its prestige very materially.

I have found the enlisted force of the constabulary of the district of a much lower order of intelligence than that of other districts, but this will be mentioned later under the heading of "Provinces and districts."

Officers have generally performed their duties with energy and zeal, sometimes under adverse circumstances. Special investigation calling for changes or relief and recommendations and commendations have been made the subject of special reports.

While all the officers are instructed to assist the district governors in every way possible, the following have been called upon specially for duty with the Moro Province or in districts: ^a

^a List on file in War Department.

ARMS.

The arms in the district are generally in fair condition. The carbines, however, have the rifling worn in the bore to such an extent that officers are making serious complaints of their inability to instruct the men in target practice from the fact that any degree of efficiency in marksmanship is impossible on this account.

The district supply officer has been instructed to requisition for additional machetes. On several occasions during the year they have been used for fighting, and in this unexplored mountainous, and wooded country they are used for cutting trails whenever off the beaten track.

Ammunition is ample and satisfactory.

Some complaint is made that springs and other parts of revolvers break easily. It is also complained that the carbines break easily while snapping at drill or when firing. I do not, however, recommend any change during the present year, as the expense of rearming the constabulary would be more than we would be justified in incurring at this time.

MEDICAL ORGANIZATION.

We have a hospital at Zamboanga recently established, one at Davao established during the year. The constabulary at Siasi and Bongao are taken to Jolo when necessary for medical treatment. Those at Mati and Davao are cared for at the constabulary hospital at Davao. Those at Catabato and Iligan, at the military hospitals at those places.

This leaves Tucuran, Dapitan, Misamis, Cagayan, and Surigao without provision for treatment in cases of sickness. At none of these places is there a local doctor competent to look after the men.

The proposed plan in the district is as follows:

A district surgeon is to be stationed at Zamboanga to take charge of the hospital there, to attend daily sick call at Calarian prison and the company at Zamboanga, to make occasional visits to Tucuran, and from time to time inspect the entire district.

Doctor Ames, at Davao, is to look after sanitary and medical treatment for Mati and Davao. It is also proposed to construct a hospital building when practicable at Davao, so arranged that Americans who have located in that gulf can receive proper treatment. I have submitted a special report covering this matter in detail.

The surgeon of the district is in receipt of information that an additional doctor is now en route from Manila with supplies for the year. My intention is to station him at Dapitan, and to have constabulary soldiers from Surigao, Cagayan, and Misamis brought there for treatment, simply establishing a small ward, and have the doctor make a monthly trip from Dapitan to Surigao and return for inspection and instruction relative to such treatment as may be received at the station independent of a medical officer.

The constabulary at Siasi and Bongao will continue to be sent to Jolo when necessary.

This arrangement will make fairly good provision for all stations except Tucuran; there being no direct line of boats to that place a special trip will from time to time have to be made on the *Malecon*.

I have requested officially that Doctor Ames be not taken away from Davao. His services there among both Americans and natives are valuable and appreciated. He is doing much charitable work, and it would be difficult to replace him at this time. As he is near the head of the list and will soon be eligible for promotion it is recommended that he receive his promotion and remain where he is. He does not care for the position of district surgeon, but prefers to remain at Davao.

BUILDINGS.

Appendix B gives a tabulated statement of buildings occupied and rents paid in the district.^a

A contract has been let and the contractors are now constructing a building at Zamboanga on a plot of land donated by the Moro Province, which will be used for headquarters, all offices (including that of the senior inspector of Zamboanga), stores, and cuartel for one company.

^aAppendix B is on file in the War Department.

TRANSPORTATION.

Prior to my arrival in this district Colonel Harbord had assigned to him the steamer *Ranger*, but upon his relief it was taken to Manila and assigned to another district. The coast guard cutter, *Mindanao*, was assigned to the constabulary of this district. Shortly after my arrival I was informed that a charge of ₱155 per day would be entered against the appropriation for the constabulary for the use of this boat. This appeared to be an excessive amount of money to be withdrawn for transportation for this district for the use of a boat. I therefore requested that it be placed on a route for twenty days in the month and that I use it ten days, with the privilege of utilizing in case of an emergency at any time. In due time, while in Manila, I ascertained that I could procure the launch *Malcoon* for an entire month for the amount which we paid for the *Mindanao* for ten days, and requested the change. This launch has performed satisfactory work here, but at the rate of ₱60 per day it still cuts a deep hole in our appropriation. Its use, however, is a necessity, as without a special launch there are stations, such as Tucuran, which could never be reached, and with the limited number of boats that cruise in these waters a district director could not keep in touch with conditions nor meet emergencies except with the use of a special launch. The launch has but poor accommodations, there being no state room and it being necessary to live and sleep on deck. On a trip of from ten to fourteen days this becomes a little monotonous, but we do not expect to enjoy the flesh pots of a metropolis nor the comforts of an ocean steamer while inspecting in Mindanao. It was thought at the time this launch was sent here that the passenger traffic might reduce its running expenses largely, but such has not been found to be the case. The accommodations are so poor that people prefer to delay sailing until a boat with better accommodations is available. We economize considerably by carrying our own freight when practicable. Beyond this, the boat is simply an expense without corresponding income to lessen it.

All stations now have row or sail boats. Surigao has the launch *Captain Clark*. I have spoken of it in detail under report of that province.

SCHOOLS.

Officers have taken considerable pains during the year to teach the enlisted men. They have made fair progress where the companies were composed largely of Visayans or Zamboanguenes, but where they are composed of pagan tribes and Moros but little progress has been made. It takes the better part of one year to teach a man to sign his name on the pay roll. He is correspondingly stupid in everything else. They can be taught to drill on the parade ground and they can be taught field duty, but to teach them independent responsibility or teach them anything from books is a most difficult task. Where night schools have been in operation in the vicinity of constabulary stations the enlisted men have been required to attend and have made some progress. The teachers, however, do not give much encouragement and state that men of this age are far more stupid and learn much slower than children; still some progress has been made in this line.

CONCLUSIONS.

The conduct of the constabulary has been excellent during the year. There have been no complaints from people of abuses. With one or two exceptions, which have been acted upon in special reports submitted, the conduct of officers has been all that could be expected. The class of officers which we have in the district now is such as to make efficient work possible and add prestige to the organization.

The relations between the constabulary and military have been most pleasant. There is no instance of discourtesy on the part of either, and military officers are always very glad to have a constabulary detachment with them, in connection with their troops, when making expeditions into the field.

We are indebted to the military for many courtesies and to the chief quartermaster of the department for assisting with transportation on launches and transports; also frequently for the use of a launch when necessity demanded it. He has also been extremely kind in furnishing us from time to time a limited amount of expendable material in making repairs on buildings and forts occupied by the constabulary, but which are subject to use by the military if occasion should require.

The relations between the commanding general and governor of the Moro Province and the district director of constabulary have been harmonious, and the work has progressed in a most satisfactory manner.

The following report by districts and provinces is given in some detail. The accompanying photographs are characteristic.^a I regret my inability to procure similar ones from all sections.

DISTRICT OF COTABATO.

Governor: Capt. Charles T. Boyd, Tenth Cavalry.

Secretary: Mr. L. P. Hamilton.

Senior inspector: Capt. Henry Gilsheuser.

Station: Cotabato.

Population: About 60,000.

The station is located on a prominent hill overlooking the town of Cotabato, a distance from the wharf of about three-fourths of a mile. A wagon road leads to the top of the hill, but is very rough from large broken stones, and two carts which were used for hauling water to the station were rendered unserviceable from broken wheels due to this road. All water must be hauled from the river. Through courtesy of the army's distilling plant drinking water is furnished from that source.

The district is a little larger than New Jersey. It has the largest river system in the archipelago.

The strength of the constabulary has been reduced from 100 to 50, but to date has been kept at 65; other companies have vacancies to correspond. With present strength we have one constabulary soldier to 166 square miles of territory. Therefore at present the army must be almost entirely depended upon for work in that section, except in small matters.

The population consists of fanatical Mohammedan Moros, uncivilized Tirurayes, Dulanganes, Bilanes, and Buquidnones. Some of these tribes are now feeling the effect of law for the first time, except such as has been administered by dattos under Mohammedan rules.

Our work relates to enforcement of the law, in carrying out the provisions of the slavery act, investigations referring to same, returning captives to their people, protecting mountain tribes from Moro raids, preventing the levying of tribute and imposition of fines by dattos, guarding against smuggling of arms and opium from the Celebes, disciplining unruly dattos, exploring unvisited country, etc. With these multitudinous duties it can readily be seen that with but a handful of constabulary no progress whatever could be made if we had to depend upon that alone, and the present indications are that the army will have to continue to operate from time to time in that district for an indefinite period. At the present time conditions are quieter than they have ever been before, owing to the death of Ali and the surrender of a large number of his people with some 200 guns and the corresponding amount of ammunition; still there are sections of the district which have seldom been visited, nor is it practicable to do so without transportation. A gasoline launch should be furnished for navigating the Rio Grande and its tributaries, from points of which explorations could be made.

The Cotabato Valley will eventually become one of the most productive and important, commercially, in the islands, but at the present time it is suffering from a severe setback, due to the stoppage of all production in the country inhabited and controlled by Ali and the failure of any of the natural products of that section to reach Cotabato. Last year's rice crop was excellent, and had it not been for the Ali trouble in the early part of the year, would undoubtedly have been the largest ever produced there.

The valley, when properly cultivated, will produce hemp, cocoanuts, coffee, and cacao, together with the natural products of wax and gums.

The senior inspector reports having recently visited the mountain sides and seen fine plantations of coffee, with trees in excellent condition and full of fruit. The trade of the district at present is largely controlled by Chinos and two Spaniards. The Moros trade mostly with the Chinos, while Americans and others trade with the Spaniards. So far but one white settler has attempted to locate for agricultural purposes, but it is believed that with the death of Ali and the return of peaceful conditions, ere long the white population will begin to make investments there.

^a Photographs are on file in the War Department.

A representative of a Hawaiian sugar corporation visited the district in October, but made rather discouraging remarks as to the locality for sugar, stating that the ground contained too much clay.

The constabulary took an active part in the campaign against Datto Ali, and received from the department commander highly commendatory comments upon its work. Since that time but few expeditions have been made; one in pursuit of carabao thieves who, in a fight with the datto's men from whom the animals were stolen, killed and wounded some seven people. The constabulary only pursued them to the edge of the Buldung country, as it was not at that time deemed advisable to stir up a hornet's nest. The constabulary is now operating with a view to the death or capture of Dimabara and his confederates, who murdered Private MacDonald at Parang some months ago. In an attempt, on July 6, to arrest these people with a small detachment of constabulary, a fight resulted in which 6 Moros were killed; no casualties in constabulary. (See report by Lieutenant Furlong, forwarded on July 23.)

The relations at this station between the army and constabulary are extremely pleasant both socially and officially.

Commercial boats go up the Cotabato River to the town without any hesitation, but coast-guard boats generally anchor about 1 mile from the mouth of the river, although they draw the same amount or less water than many of the commercial boats. This made it at times extremely inconvenient to reach this station, as we had to depend upon the courtesy of the army to send a launch to the mouth of the river upon receipt of a telegram from Malabang or Parang announcing the arrival of a coast-guard boat. Under recent contracts with commercial boats this nuisance will disappear.

DISTRICT OF DAVAO.

Governor: First Lieut. Allen Walker, Philippine Scouts.

Secretary: Mr. O. V. Wood.

Senior inspector: Capt. Waldo B. Williams.

Constabulary: Two companies; Second at Davao, First at Mati.

Barracks at Davao of nipa, constructed and formerly used by army. Dilapidated and must be practically rebuilt within the year. The senior inspector boards and rooms with a private family; is married, but no children. The medical officer, Doctor Ames, occupies a rented house in good condition; married; three children. The company officer lives in the hospital, an old government building on verge of collapse.

The constabulary is made up from an aggregation of eleven tribes, generally of a low order of intelligence and but indifferent material for soldiers. To outward appearance they look well, but the only men in company who can be trusted with discretionary duties are those transferred from other places.

The barracks and quarters at Mati are of nipa and wood, formerly used by Spanish troops, overhauled and used by American troops. The buildings are in fair repair, and nothing special will have to be done on them during the present year. They are of lathing and plaster; the latter has nearly all fallen away.

At Davao and Mati there are fairly good harbors. Vessels anchor about 400 yards from shore off mouth of Davao River.

At Baganga, where a station has been maintained until recently, coast-guard boats do not venture during the northeast monsoon, and the place is isolated from October until May. An occasional commercial boat visits the east coast during this period.

The district has four municipalities, but with the exception of Davao they are not progressive and of but little importance.

The district is inhabited by some fifteen Pagan tribes. There is in consequence no trouble to be feared by stationing small numbers of constabulary at isolated places, as probably no combination of these tribes can be effected for the purpose of evil doing. An attempt was made in this direction recently. I add below a synopsis of my report on this.

The duty of the constabulary is to prevent raids and reprisals between the coast and interior tribes; to prevent slave dealing which exists to a considerable extent on the east coast, and to assist the district governor. The constabulary can be made to exercise a decided influence in civilizing these people, and this influence can be largely increased by its liberal use by the district governor. Governor Bolton was one of the most inveterate explorers in the islands, and

by his personal contact and influence did much to bring these people in touch with civilization. His untimely death was a great misfortune.

The constabulary is of a rather low order of intelligence and but for a sprinkling of Visayans would be graded on a par with that of Bongao. Two speak English, 5 Spanish, 17 can sign pay roll. They are a good-natured and kindly people and in time can be made fairly good soldiers if we are fortunate enough to have them supervised by the proper class of officers.

On the east coast there is much complaint that the coast people, mostly Visayans, impose upon the mountain tribes by cheating them in their business dealings with them and by "Caciquism" and grafting.

Instances occasionally occur when some "Jefe Local" shoulders an old gun and by threats compels the timid mountain people on some pretext to present themselves and work on the private property of the "Jefe." An instance occurred in April near Cateel, one De Los Reyes, a planter, had imposed upon one Badudas, a Mandaya, and his family; finally, when these people resented the treatment, the son, Margarito, was, on some pretext, thrown into jail. Reyes went to the house of this man and raped his wife, who, with his followers, later went to the house of Reyes and murdered the entire family. After several expeditions Margarito was finally caught, in June, and lodged in jail in Davao. His people retaliated by visiting the coast and murdering 16 people—men, women, and children. The constabulary is now in the field on the east coast in pursuit of these murderers.

On October 16, at request of the district governor, Lieutenant Furlong undertook to arrest a Manobo datto, Sulutan, and his son for the murder of a Tagacolo. A fight ensued in which the datto and his son were killed and two constabulary wounded. The life of the officer was saved by Mr. Christian, a planter, who was since murdered with Governor Bolton.

On April 25, Captain Williams, with a detachment of constabulary, undertook to arrest a Bilan in the mountains near the Cotabato line. The outlaw party consisted of two men, five women, and two children. Immediately upon these people learning the purpose of the constabulary they ferociously attacked, and a hand-to-hand struggle ensued, the women and men fighting like demons. Two men and two women were killed. Captain Williams states that the men might have been induced to surrender, but that at the first indication of this a woman grabbed a man, faced him about and pushed him into the fight. These matters have been made the subjects of special reports.

On June 6 Governor Bolton was murdered by Subchief Mangalayan, of tribal ward No. 4. As this resulted in military operations and stringent measures in that district, a synopsis of my report follows:

ZAMBOANGA, MINDANAO, July 18, 1906.

* * * * *

"Prior to February 22 Governor Bolton had arranged for a meeting of all the prominent tribesmen to meet him at Malalag for a grand powwow and fiesta, which was duly held and pronounced a grand success. At this meeting several tribal wards were established and headmen and other officials appointed for the mountain tribes.

"The Tagacolos, Manobos, Bilans, and Calagans are more or less connected by contiguous territory, marriage, etc.

"While there is no close touch between these, the Bagobos, Moros, Mandayans, etc., Governor Bolton had been untiring in his efforts to induce several of these mountain tribes to locate nearer the seacoast, establish permanent villages, and make permanent improvements and investments by planting hemp, coconuts, etc., instead of destroying timber in making a clearing, harvesting one crop of palay or camotes, and the next year destroying the timber in making a clearing elsewhere.

"He at times spent weeks among these people alone and unarmed, and there is no doubt that generally they were devoted to him.

"He had induced Balawag, a Tagacolo datto, to come from the mountains and establish his village at the head of a tide-water inlet some 6 miles from the coast and 8 miles northwest of Malalag.

"At the meeting on February 22 he established the Tagacolo tribal ward with Balawag as head man and Mangalayan a subordinate official under Balawag and placed him, a Tagacolo, in charge of a settlement of Manobos. For a time everything went well apparently, but recently mutterings of discontent on the part of certain natives were repeated to planters at Bulatakai, Padada, Mala-

lag, and Kibulan by their friendly employees to the effect that certain Americans were to be killed, among them the governor and Mr. McCullough, a planter at Kibulan, who was officially an assistant to the governor and directly in charge of the recently established Tagacolo ward. The mutterings grew louder and extended to the proposed killing and robbing of all Americans from Digos to Kibulan. The planters became alarmed and reported these things to the authorities in Davao.

"It further appears that a native by the name of Simbanan has posed as a healer for the past two years among these tribes, professing to give the people immunity from bad luck, sickness, etc., through charms which he sold to them. He has been more or less intimately associated with Balawag and Mangalayan and exercised considerable influence over them. Careful investigation convinces me that he had incited Mangalayan to action against the Americans.

"It further appears from testimony given by natives that Balawag, Mangalayan, Sambanan, and several natives, relatives, and friends of Mangalayan, among them Sulutan and Kawag, from Digos, had a meeting at Mangalayan's place at Daul in which it was decided that Mangalayan should kill and rob the Americans at Kibulan, Balawag those at Malalag; then the two, those at Padada and Bulatakalai, and then Sulutan and Kawag were to kill and rob those at Digos. This plot does not seem to have been specifically laid out as to who was to do the killing except as above, though the investigation brings out a general train of evidence that all the Americans were to be killed and robbed. Running through this chain of evidence appear instances of natives who had refused to engage in the plot and had agreed among themselves to protect certain planters. Statements concerning the above are appended. In addition many rumors and statements were listened to but not reduced to writing, the whole of which led me to above conclusions.

"It further appears that from five to eight months ago a dance was begun at Sumlug, on the east side of Davao Gulf by a fanatical Moro, Sumalugpun, and taken up by two Moro dattos, Compao and Tomaras, who conceived the idea of using it primarily for graft. This dancing craze had extended from the Tagum River to Padada, with natives attending from as far south as Kibulan and possibly further, as the investigation is still in progress.

"For two weeks we worked persistently without much progress as we found the Davao Moro the most accomplished, persistent, and variegated liar on earth. Ananias of biblical fame owes his distinction to the fact that the Davao Moro was not present to be chosen for an example. They would first lie on general principles, then in trying to guess what you wanted them to say, and finally in telling what someone else had said. Many denied any knowledge of the dances, later admitted them but were celebrating a wedding, and finally broke down and made a full statement of what they knew. The statements of the more important ones are appended, and represent weeks of tedious work by Captain Langhorne, Lieutenant Walker, of the scouts, and myself.

"A summing up of the evidence is about as follows: Compao and Tomaras discovered a new god called 'Lavi' who would appoint Compao king of the Moros when he came; he would also bring good crops and plenty of fish; bolos and axes would do their work while the Moros sat by; fishing even with a short rod would be productive of plenty of fish; sickness would disappear, etc., but the good will of the 'Lavi' could only be procured by liberal donations; nothing good would come to those who failed to donate; and if any one told the Americans anything the 'Lavi' would pull the tongue out. Finally the Visayans were to become the slaves of the Moros, and the Americans and Spaniards driven out or killed.

"Compao and Tomaras successfully worked the people of Sumlug, then sent word to Datto Macibelan, at Lepandi, to come and bring his friends with contributions and see the 'Lavi' and learn the dance. He went taking nine companions; they learned and returned, all having been ordained Tataiyans (preachers) by Compao and Tomaras. They established a school at Lepandi; the pupils from Saranan learned, and in turn taught those of Daron, Digos, and Padada, each of which in turn had the dances, taught and excited the people and took contributions, half of which should go to Compao and Tomaras. The matter was fast becoming a fanatical craze. The Bilans and Tagacolos came and brought contributions, and while there was no dancing south of the Padada, as before stated, the Tagacolos from as far south as Kibulan attended.

"The nine people who went to Sumlug state that Compao predicted the early death of Governor Bolton. This will be referred to later.

"Governor Bolton, realizing that the dance was becoming widespread, went

to Sumlug to investigate. He described in a letter to Lieutenant Poillon, just before his death, that when he went to Campao's house Campao was not in, but when a number of people had congregated he bounded in like a crazy rubber ball, with campilan in hand, and danced around and advanced on the governor who simply stood and watched him. He finally quieted down, put his campilan behind him and advanced to shake hands, asking, 'Is it good?' The governor took him and Tomaras to Davao, but Sumalugpun escaped. He did not imprison them but allowed them the freedom of the town; they loafed about the landing and continued to receive contributions.

"This was the status of affairs when Governor Bolton left Davao to investigate the rumors of trouble as reported by the Americans south of Padada. He went to Balawag's place, stayed over night there, went to Mangalayan's place and stayed over night with him, was joined by Mr. Christian, and taking Mangalayan and two of his brothers started to visit Simbanan. They passed a fisherman's hut just before nightfall and passed some commonplace remarks with him. Mangalayan's party returned in half an hour, and Mangalayan said: 'I now feel like a man again; I have killed those two Americans.' I inclose a clipping from the Mindanao Herald of June 16 which is so nearly accurate that its perusal will give the details without rehearsing them here.

"The Americans cautioned Governor Bolton of his danger, but he made light of it. It will probably never be known whether he put on a bold front to allay their fears and restore confidence or whether he relied implicitly upon the friendship of these people or held their threats in contempt. His firearms were rolled in his blanket when killed; it would therefore appear that he relied upon their friendship. It has been claimed that Governor Bolton stabbed Mangalayan. I doubt it, from the character of the wound across the head, apparently given while lying down, and which must have killed him instantly.

"The investigation showed that two separate and distinct factions were at work—one the dancing craze, organized by Compao and Tomaras, having for its primary object graft and teachings of a fanatical nature, which was becoming widespread and might in time have resulted in murder of Filipinos, Spaniards, and Americans; but it is believed that the time was remote, and when contributions stopped the craze might have died a natural death. Its origin was with the Moros, and no dancing was held south of the Padada River. Though efforts were made to get other tribes interested, which had been done to some extent, the question of contributions seems to have been largely the object of interesting them.

"The other was a more or less well-organized scheme on the part of certain Tagacolo chiefs and their followers and kinsmen to murder and rob the Americans owning plantations within the limits of the Tagacolo territory. Mangalayan may have, by the murders he and his two brothers committed, acted sooner than he intended or possibly the rest lost their nerve and through cowardice failed to carry out the scheme.

"It is possible that these two schemes were connected and that Simbanan had been to see Compao and Tomaras or that they had visited him, but we have so far absolutely failed to establish such connection. The only evidence strongly pointing to this connection is Compao predicting the early death of Governor Bolton. This was before he visited Sumlug and before Compao executed his war dance in front of him, and he (Compao) may have had in mind having the governor killed by himself.

"The one reliable source of a better knowledge of the whole matter, namely, the governor's diary spoken of in his letter to Lieutenant Poillon, has not been found; there is a possibility that it may yet be.

"A few days after the death of Governor Bolton, and prior to arrival of troops, Mangalayan, Datto Dauda, and a heterogeneous aggregation of natives looted Mr. McCullough's store at Kibulan.

* * * * *

"The dancing craze had nothing to do directly with Governor Bolton's death. If this dancing had been allowed to continue, it is probable that serious results might have followed it. It is now believed that it is practically broken up, and a moderate punishment of the leading spirits will probably suffice to prevent a recurrence of it. Its primary object was probably graft, but its ultimate object was undoubtedly more serious.

"With the return of the Tagacolos to their homes it is believed Mangalayan's object in murdering the governor will be ascertained.

"There was probably some communication between Simbanan and Compao and Tomaras which was not carried along the coast, but by direct communication between Sumlug and Simbanan near Malalag.

"Several things may have combined to have caused the death of the governor, or any one of these may have been the cause. Mangalayan was given a subordinate position under Balawag; he may have resented this. Mangalayan gradually saw his prestige among his people disappearing and his followers falling off. He may have thought that by performing some deed of valor, such as murdering the governor, would cause him to regain his prestige. Simbanan may have influenced him to the murder through superstitious means. Mangalayan may have resented the discipline which was being placed on him and his people by restricting their roving from place to place and being required to settle down in a particular locality. This seems probable from the fact that the resentment extended to Mr. McCullough, the official directly in charge of the Tagacolo tribal ward.

"It is believed that Mr. Christian's death was simply an incident, he being in company with Governor Bolton."

No account given here of operations.

As this affair is still unsettled, it will probably be necessary to protect some of these planters for a time by small detachments. The Forty-fifth Company of scouts is on duty in the district. Owing to the number of American planters who have settled on the Gulf of Davao, and the extensive improvements and investments which have been made there by Americans, it is very important that peace conditions prevail in that section. Three of these planters, for personal gain, introduced powder, in violation of law, into the district, and sold it to the savages. The matter is now awaiting the action of the courts.

DISTRICT OF LANA O.

Governor: Maj. E. W. Griffith, Philippine Constabulary.

Secretary: Mr. Alan Gard.

Senior inspector: Maj. E. W. Griffith.

One company at Iligan. That portion of Misamis Province west of Iligan Bay is attached to the district of Lanao, with one company at Misamis.

Population about 36,000 in Lanao district proper. All are Lanao Moros, except a few Filipinos around Iligan and Malabang. One constabulary soldier to 78 square miles of territory and to 715 inhabitants. The population consists of the most undisciplined tribes that we have to deal with in the archipelago. They are kept under control through military force and through its moral effect, large stations of troops being maintained at Overton, Keithley, Vicars, Malabang, and Parang for the purpose.

The work of the constabulary relates to bringing these turbulent people within the control of the law and to preventing slave trading, murder, and imposition on Montescos and Subanos who live on two sides of them. With only 50 constabulary for this purpose the work must necessarily be on a small scale, but under present conditions, with the senior inspector of constabulary the district governor, the best possible use is being made of the constabulary.

The harmonious relations existing between the army and constabulary in the district also gives much encouragement to the latter in its work.

To one unfamiliar with conditions in this part of the archipelago the policy of the senior inspector of constabulary filling the office of district governor might seem inadvisable, but in the Moro province conditions are such that by this means the best results will obtain.

The constabulary at Iligan is well drilled and disciplined. In intelligence the men compare favorably with those of Cotabato. One speaks English, 2 Spanish, and 20 sign name to pay roll. Much credit is due Major Griffith for his efforts and success in administration of his district. Capt. William Green commands the company at Iligan and assists the senior inspector in the routine of that duty.

The old military hospital is used for quarters for officers and men at Iligan, is in fairly good condition, and has been made comfortable by labor of the men and ornamented in a manner to please the Moro.

The grounds have been ditched until a former marsh is now a healthy locality, ornamented by growing trees, flowers, and shrubs, and utilized by converting a part into a vegetable garden, from which officers and men derive considerable addition to the table.

A flock of goats has been purchased from the mess savings, and are breeding and still furnishing considerable meat for consumption.

Five nipa houses have been built for married men, the men provided with musical instruments, and a colony formed which adds much to the contentment of the men and lessens their desire to be absent from the station in pursuit of diversion. The men have been instructed in athletics and play a game of baseball that would do credit to a company of American soldiers. The station at Iligan shows what it is possible to do in the way of improving men of the Moro type, by providing them with surroundings which will eventually enlighten them and encourage them to more civilized methods of living.

Water is procured from well and near-by river.

The station at Misamis has been referred to under remarks on Misamis Province.

There is a good port with wharf at Camp Overton, 3 miles distant. Poor anchorage at Iligan.

DISTRICT OF SULU.

This district embraces the islands of Jolo, Siasi, Tawi-Tawi, and other groups as far south and west as the possessions of the United States extend.

Governor: Col. Edgar Z. Steever, Fourth Cavalry. He has just relieved Maj. Hugh L. Scott, Fourteenth Cavalry. The latter officer endeared himself very much to the chiefs throughout the district, and they were fast learning to depend upon him and to appeal to him in all their troubles.

Secretary: Capt. James H. Reeves, Fourteenth Cavalry.

Senior inspector: Capt. Frank S. De Witt.

Constabulary stations: Siasi, Bongao, and Sitanki.

Population, as given by census, 82,688, all Moros; the actual population is probably about 54,000.

The Moros of Jolo rank in intelligence and prestige next after those of the Cotabato Valley. The Sultan of Sulu exercises some control over them, under the supervision of the governor. They have given considerable trouble in the past, resulting in extensive field operations and many casualties. The most recent was in March, when troops were assembled at Jolo, composed of cavalry, infantry, and artillery of the regular army, a naval detachment from the gunboat *Pampanga*, and constabulary, with which an attack was made on natives who had fortified themselves on Mount Dajo. Nearly a year ago a remnant of the outlaws, left after the Pala expedition, gathered their friends around them and settled around and on Mount Dajo. Governor Scott gave them permission to live there on condition that they would harbor no criminals, abstain from depredations on their neighbors, and pay their taxes. Little by little all these agreements were broken. They finally became so defiant and fortified themselves so strongly that it was necessary to discipline them. As a result nearly the entire outfit were exterminated in this fight. A detachment from the Third Zamboanga and the First Sulu Company took part, and acquitted themselves with much credit. A special report was submitted, giving in detail the accounts of this affair. Three of the constabulary were killed, and 13 wounded. Capt. John R. White, the adjutant of the district, who commanded the detachments, was also severely wounded. The constabulary was given the honorable position of the head of one column, which ascended the steep slopes of the mountain and finally engaged in a hand-to-hand fight with the enemy in their cotta at the crest of the crater. The casualties in the constabulary detachments amounted to 40 per cent of their strength. As a result of my recommendations, Captain White and Supply Sergeant Arcadio Alga were given medals of valor for distinguished bravery in this engagement. (See report to the executive inspector, dated March 10, 1906.)

The Moros of Siasi are entirely peaceable. There are no prospects of trouble. They are not as intelligent as the Jolo Moros, but less likely to cause trouble.

The constabulary station at Siasi is a picturesque little place, with an old stone fort, which was until recently uninhabitable, but by use of constabulary labor and the courtesies of the department commander in furnishing us as much available material as could be spared, it has been placed in good serviceable condition, and is ample for all needs of the station. The old nipa building, which was used as officers' quarters, is now converted into a gymnasium. The repairs to the fort were made under the supervision of Captain De Witt, in which he has exercised judgment, intelligence, and economy. With the establishment of the gymnasium and baseball, the constabulary of this station has become much interested in athletics.

The military constructed a wharf when stationed here, which is in fairly good repair, with a depth of water adjacent sufficient for interisland transports to anchor safely, and when necessary to blow down and clean boilers.

Water is supplied from an adjacent mountain stream, delivered through pipes installed by the military. The pipe extends to the wharf, where boats can be supplied with fresh water.

The town has a municipal organization; officials appointed by the district governor. Until recently they were mere figureheads, but upon my recommendation Captain De Witt was appointed presidente of the town, and already the appearance and improvement have justified this action. In addition to being presidente of the town he was also appointed in May, by the governor-general, justice of the peace for the district of Siasi.

The senior inspector, Captain De Witt, is stationed here. The company has but one officer. Both this company and the one at Bongao should have a complement of officers. A repetition of the Hayson tragedy in that section will not redound to the credit of the constabulary, and a point should be strained in supplying these companies with the necessary officers in order that the stations may never be left without one.

BONGAO.

This station is situated on a small island of the same name. The town has but few inhabitants, is filthy and without any form of government or responsibility, totally lacking in any industry or enterprise. I have recommended to the secretary of the Moro province that it be formed into a municipality with the constabulary officer as presidente, the collector of customs as treasurer, the school teacher as secretary, and the head Chino and Hadji as councilmen. By this means some improvement can be made. Either this or a tribal ward should be organized there.

The inhabitants of this and adjacent islands are composed of the poorest and most ignorant type of Moros, devoid of any pride or enterprise.

Conditions are peaceful, but a recent report from the constabulary officer relates an amusing incident of two dattos claiming the same piece of ground, building forts within 100 yards of each other and fighting furiously for ten days. Upon the officer's approach a truce was declared until he could be interviewed. An inspection showed the casualties amounted to one man on each side mortally wounded, wounds putrified; still they both declined Christian aid. As a punishment for this act these Moros were fined 17 guns, which they quietly surrendered without a murmur. (See report of Lieutenant O'Grady, forwarded by indorsement of January 8, 1906.)

The buildings occupied by the constabulary were built by the military—a barrack and officers' quarters of nipa and wood. They are fast falling into decay and will soon have to be extensively repaired.

Water of an indifferent quality is carried from a well at a distance of 1 mile. Ships anchor about 400 yards from shore. Harbor safe and fairly good.

Upon my first inspection of Bongao I found the company composed of the most ignorant and indifferent soldiers in the district; not a man in the company could read or write, and not one suitable to be a noncommissioned officer. One could speak a little English, 1 could sign the pay roll, 8 could speak a little Spanish. At the present time 1 speaks good English, 1 can write it, 20 speak Spanish, 15 write it, and 21 can sign the pay roll, due to the enlistments of more intelligent men into the company during its station at Zamboanga. I urged that a suitable noncommissioned officer be sent from Luzon to be appointed first sergeant. Such a man arrived here about two months ago.

In order to bring this company in touch with civilization I sent the General Service Company to Bongao and brought this company to Zamboanga, where it has now been for six months, and will shortly be returned to its station. Many of the more indifferent men have been discharged and a sprinkling of Zamboanguenos and Filipinos placed in the company. The entire tone of the company has changed and to-day it presents a very creditable appearance, and there is sufficient intelligence among the enlisted men to expect efficient service. This company proved its bravery and indifference to fighting its own people, when necessary, in the engagement at Mount Dajo. With the additional intelligence instilled into the company by enlistments of outside men, and by the touch of the company with conditions in a more civilized community, it will return to its station in much better shape.

The duties of the constabulary of the Sulu district will be for a long time explorations among the 188 islands forming these groups and assisting the dis-

strict governor. A small launch propelled by gasoline or steam should be furnished for this purpose. I allowed the senior inspector to have the *Malecon* during the month of May, by means of which he visited all the more important settlements. The result was extremely beneficial, from a constabulary standpoint, and much assistance was rendered the district governor thereby. An officer who travels about that country in a vinta is regarded as no better than the Moro; but if he inspects in a steam launch this fact alone carries weight and prestige, which adds a thousand per cent to his authority.

DISTRICT OF ZAMBOANGA.

Governor: Capt. John P. Finley, Twenty-seventh Infantry.

Secretary: Mr. J. M. Browne.

Senior inspector: Capt. John R. White, adjutant fifth district, acting.

This district embraces, in addition to Zamboanga, the former district of Dapitan, the island of Basilan, and adjacent small islands in the district of Jolo, numbering about one hundred.

There are three companies of constabulary in the district. Third Company at Tucuran. This is an old Spanish *cuartel* located on top of a hill, necessitating a climb of about a mile. Buildings are of wood with tin and nipa roofing, in good condition and will require but little repair for some years. There is no town or settlement within several miles of the station, and the only object in keeping a station there is to prevent the Moros from Lanao coming across the old Spanish trocha and robbing the inhabitants of this section of their carabaos, and to assist the district governor in his administration of this section.

The enlisted men of the company are of average intelligence, largely enlisted at Zamboanga, although there are some Moros in the company. Two can speak English, 45 Spanish, 33 can sign their names on the roll. The company possesses a higher order of intelligence than those of the Sulu district—about the same as the people about Zamboanga—and make fairly good constabulary soldiers.

The country around Tucuran is entirely unsettled and unimproved and there is a large field for settlers there who desire to engage in the cultivation of coconuts. There is a fairly good harbor during the northern monsoon, but very open during the southern period of wind. Interisland transports can anchor about 400 yards from the shore. No rents are paid at this station.

SECOND COMPANY, ZAMBOANGA.

Headquarters, Dapitan. Commanded by Lieutenant Gallagher. Junior lieutenant, Subinspector Coletto. The company is largely composed of Visayans, 3 can speak English, 30 Spanish, 20 can sign the pay roll.

There have been no desertions in the district outside of this company at Dapitan. At different intervals during the year there were 5 desertions up to March. I carefully inspected everything pertaining to the company and could find no cause in the interior economy, discipline, or administration of the company for same. The men were well cared for, well fed and clothed, and seemed to be contented and satisfied with their officers. The town and people are, according to reports from various sources, largely controlled by the priests. The people there take life too seriously and run to the padre with all their troubles. He has dictated the most minute details of their lives. They have but few amusements and none which are opposed by the church. It was therefore believed that there was not diversion enough for the men at the place, and I am still of this opinion. Complaints have reached me from many sources of religious interference by the priest with the liberties and rights of the people, and his opposition to the public school. I have also received many complaints that the priest has discouraged social intercourse between the people and enlisted men of the constabulary, the latter being more liberal minded, naturally resent this, and further resent the fact that the people avoid social intercourse with them, due to the stand taken by the priest. A young and progressive priest should be sent there by the church.

In March a disturbance occurred in the street between some constabulary and the municipal police, in consequence of which the officer confined and tried by summary court eight enlisted men, one of whom, Sergeant Torres, was an intelligent man who had worked in different capacities with American troops since our occupation of the islands, spoke excellent English, and was an all-

round good soldier. He, however, had been in trouble once or twice before, and was warned that a repetition would result in his reduction. The trial of these men resulted in the reduction and confinement of this sergeant and small punishments for the rest. The sergeant resented this treatment and induced the other prisoners to join him in a mutiny. They were working on the plaza when the noon hour approached. They were marched toward the barrack ostensibly for the purpose of getting their dinner. When at the door they rushed upstairs, grabbed their carbines and ammunition, and began firing promiscuously at the men who were eating at the table in an adjoining room. One sergeant was killed and one man wounded. The members of the company ran from the building. These mutineers then took possession of the barrack, destroying many things, and from time to time kept up a fire at the officers' quarters and the municipal building, where the guard was stationed. The guard, composed of 6 men with 10 rounds of ammunition per man, opened fire on these mutineers. One of the prisoners apparently had enough and undertook to run toward the municipal building; he was killed en route. The ex-sergeant was killed. One of the prisoners failed to join these mutineers. The other five equipped themselves with guns and ammunition and deserted. Pursuit was instituted at once and followed vigorously for almost a month. During this time all of the deserters were killed except one, who is still at large. Upon an investigation of this affair there seemed to be more or less discontent on the part of the people of the town with the Moros and Zamboanguenos who were in the company. I transferred all these to Zamboanga and distributed them to other companies, and filled up the company at Dapitan by local enlistments. Since that time there have been no further desertions and to all appearances the matter has been settled. I made very careful investigation into the causes, but can not blame the officers, but attribute the whole thing to the general atmosphere of the community, where there are no amusements nor contentment among the people. Should there be further trouble in this respect, the company will be removed from Dapitan and quartered in another town. See my report covering the matter in detail under date of April 14, 1906.

Lieutenant Gallagher is an energetic officer and looks well after his district. He is called upon to a large extent by Governor Finley to assist him in the civil administration of his district, and is performing the duties of justice of the tribal ward court, deputy governor, and deputy sheriff; has charge of the municipal police of Dapitan, and is called upon to make frequent visits in the surrounding country for civil purposes. This officer really has more work than he could efficiently perform were it not for the fact that he can utilize the subinspector largely for clerical work. A detachment is kept at Dipolog and at the present time Lieut. Thomas Ferguson is attached there. It is a tough community, with many vagabonds and renegades from Bohol and Cebu. The district governor has also established Moro exchanges in the vicinity, and the officer assists in a general supervision of same.

FIRST COMPANY, ZAMBOANGA.

Stationed at Calarian prison. Officers: Lieut. W. J. Platka and Subinspector A. Cariaga. Lieutenant Platka has been granted leave of absence and Lieutenant Youngblood has been attached to command the company and perform the duties of warden. As above stated, this company is on duty at Calarian prison, also guarding the provincial pesthouse when necessary and the treasury in Zamboanga. A detachment of 7 men is stationed in the fort at Isabela, island of Basilan. The company is composed almost entirely of Zamboanguenos, mostly Visayans. The order of intelligence in this company is about the best of any in the district. Two can speak English, 40 Spanish, 40 can sign the pay roll. Lieutenant Platka takes great personal interest in athletics. His enthusiasm extends to the men, and they play an excellent game of baseball. The acting senior inspector of the district of Zamboanga, Capt. John R. White, is also adjutant of the district. He does not have time to inspect stations. This duty has therefore devolved upon the district director.

Largely due to Captain Finley's energy, this district is probably making more progress toward civilization and agricultural and other improvements than any district in the Moro Province. However, there is a little better material to work on than in most of the other districts.

The inhabitants of the district are composed of Moros, Visayans, Subanos, and Yacans.

PROVINCE OF MISAMIS.

Governor: Apolinar Velez.

Senior inspector: Capt. John J. Gallant, sick in the United States since May 17, 1906; First Lieut. Charles E. Heartt, acting in this capacity until July 20; since that date Capt. George D. Long has been acting as senior inspector.

My predecessor described this province as the one festering sore in the fifth district since its organization.

Manuel Corrales was governor from the establishment of civil government in the province in 1901 until February, 1906, when the present incumbent was elected, the former governor not being a candidate for reelection.

Upon my first visit to the province in November, 1905, the governor said feelingly that there had been nine insurrections during his tenure of office, and another was brewing. Whether or not these were his fault, certainly a change of executive head seemed advisable. Americans complained that no official could retain his job if the governor elected that he should lose it, and maintained that such friendship could only be maintained by becoming a henchman of the governor and the Cagayan "ring." To enumerate the complaints made would consume too much time and space; many of them are matters of record at constabulary headquarters.

The Iligan Gulf divides the province into two distinct parts, with but little and difficult communication between the east and west Misamis. The most bitter complaints received from west Misamis were that the greater part of the revenue was furnished from that side, but that the people had never received any benefit from same; that not one dollar had been spent since 1901 on the west side for improvements of roads, buildings, etc., and that the east side consumed all. The governor confined himself to his office and adjacent towns, and never inspected that side of the province. In consequence, municipal officials became derelict in their duties, oppressive in their treatment of the people, and dishonest in their administration. During the past year there has been a general cleaning up of the town officials on this side by the courts, and conditions have improved.

The present provincial board has arranged for certain improvements on this side, and in time the roads and bridges, which have become, in many places, impassable, will be improved. Several barrios north of Oroquieta have been the rendezvous of criminals from Cebu and Bohol, and at present many are hiding in that vicinity. Otherwise the west side of the province is peaceful, except for religious factions which are stirred up from time to time following a visit by the agents of Aglipay.

The people are so densely ignorant that they are easily imposed upon or influenced to the commission of foolish acts. At one time the Aglipayanos in Misamis dressed up a monkey and had him with shaven pate shown around the streets as representative of a Catholic priest; in retaliation a muchacho of weak intellect was dressed up and head shaved and sent about as a representative of the class from which the Aglipay followers made their priests. His arrest and punishment by the municipal officials put a stop to the nonsense, which had been sufficient to stir up the community.

Recently a mass meeting was held in the town of Oroquieta and a petition sent to the President not to sell the country to Japan, but to allow the Filipinos to buy it. This was headed by a lawyer from Iloilo. The impression is that this man, who knew better, was procuring a graft for himself.

In Oroquieta, where more or less dissension has prevailed, conditions have much improved since the election of Mr. Paradise, an American, as presidente of the town. There are no prospects of trouble on the west side beyond these annoyances which stir up the people. This side of the province has been under the supervision of the senior inspector of Lanao district, with one company of constabulary at Misamis, which is well quartered in the fort there, thus saving any expense in the way of rents. Recently the municipal officials and constabulary officer have not been working harmoniously. In consequence I have sent First Lieut. Charles E. Heartt from Cagayan there to take temporary command of the station pending further investigation.

On the east side of the province there has been much discontent. The ex-governor was violently opposed to the Jesuit priests, and persistently tried to prove that they had influenced the people to cause trouble to the authorities by committing acts of bandolerismo. The senior inspector could find no proof that such was the case, nor is it probable, since it is well known by these priests

that they could not stay in the province forty-eight hours without American protection. The senior inspector has persistently maintained that a ring has existed about Cagayan which controlled all features of administration and conduct of the province, and that the governor was not only a member of, but a strong factor in, this ring. He adds that with the election of the present governor the former one continues to control conditions. One thing is certain: Since the election of Señor Velez there have been no disturbances requiring the constabulary to resort to arms to keep the peace, and to all appearances conditions have improved. The senior inspector insists, however, that the ring still exercises control, and that graft is running rampant, slavery continued, and the poor and mountain people imposed upon in a most shameful manner.

The province is a rich one, and were its resources developed should make the people the most contented and happiest of any in Mindanao.

Quoting from a recent report of the senior inspector, he states:

"So long as Corrales remains a factor in the political life of the province graft will continue to be the order of the day. The Neris are particularly strong and are related to Corrales by marriage. Filimeno Neri is justice of the peace, Faustino, municipal treasurer; while a third brother, Anastacio, has the contract for feeding the provincial prisoners. Numbers of the natives are arrested for trivial offenses and sent to jail by the justice of the peace; the money paid by the province for subsisting the prisoners is then divided with Corrales and the justices."

A charge so serious as this, it seems to me, should be investigated by some one thoroughly competent and absolutely unprejudiced.

Should any trouble arise in the province it will probably be in that section west of Cagayan, in the vicinity of Salvador and Inatao; these towns are non-progressive, and the people of the latter discontented and restless. The senior inspector reports meetings of the "Katipunans" in various barrios of Cagayan, but has not sufficient evidence to convict. The sergeant of municipal police, who was formerly first sergeant of constabulary there, can be trusted, and through him we will eventually procure sufficient evidence for action.

Thirteen good ponies are kept at Cagayan, and forage is stored in certain towns and barrios to enable the constabulary to reach any point in this section quickly in case of anticipated trouble. The leaders in these meetings are natives who were identified with the uprising there in 1904, but through lack of proper and sufficient evidence were acquitted by the court of first instance. The mounted detachment of Cagayan has warranted the expense, as the facility for quickly reaching a locality of trouble has a wonderful deterrent effect on the agitators.

Rinderpest broke out among carabaos in the vicinity of Jimenez in April; 60 head died during April and May. The veterinarian, Mr. Hollingsworth, has inoculated several hundred head, and the disease is now believed to be under control. The province is free from surra.

The shortage in work animals accounts partly for the small amount of land in cultivation. I am told that but little more than one-tenth of the acreage cultivated in former years is now under cultivation. I have not investigated this statement since hearing it. The prospects for good crops this year are not promising.

As a whole, conditions have improved very much during the past year, and we have been longer without a disturbance than at any other period since the organization of the constabulary in this province. I really believe that Governor Velez will do what he can to prevent disturbances, and were he free to act without strong influence being brought to bear upon him by the politicians of Cagayan, I believe that he would make a good governor. It is to be hoped that he will resist any efforts on their part to cause trouble in his province during his administration.

BUSINESS CONDITIONS.

Exports during the year were 25,000 piculs of hemp, 25,000 piculs of copra, and 35,000 piculs of rice. During July and August business was dull; from then until December, less active than during the corresponding period of 1904. From December until April business was at a standstill, but improved somewhat from April to July. The falling off of business is attributed to continued droughts, causing a falling off in both hemp and copra.

NONCHRISTIAN TRIBES.

The following are the names of those inhabiting this province: Montescos, Manobos, and Tigwahanos.

The Montescos reside in the mountains which lie behind the coast range. Population, approximately 2,500. About 1,000 are Christianized and have descended from the mountains and constructed some sixteen small villages. These are situated along the trail from Agusan to Sevilla and on the table-land lying behind the coast range. They were Christianized by the Jesuit padres of Tagaloan. Their principal products are hemp, coffee, and chocolate. They are intermarried to some extent with the Manobos.

The Manobos are found south of the eighth parallel of latitude and live mostly along the Pulangi or Rio Grande de Cotabato River. They are peaceful and well disposed, and with the exception of tribal disputes have never been known to give trouble.

The Tigwahanos live on the Tigwa River, a branch of the Rio Grande. These people are tree dwellers, tattooed with the design of a leaf, peaceful if well treated, and will assist rather than hinder any expeditions or explorations. These mountain people some time ago applied for some form of government among themselves, and that they be not subject to the government of Misamis Province. A recommendation was made to that effect, and that they be placed under the rules and laws of the Moro Province and an American stationed among them as a tribal ward chief. I understand, however, that they have been attached to Misamis Province. There has been much complaint that the coast people oppress and cheat them, and that they do not receive for their produce nearly what they should. I am convinced that a good American among them, having the powers of a tribal ward justice, with a simple form of government under the Moro Province, would be beneficial to them and stop this oppression.

FINANCIAL, ETC.

The constabulary until recently was in charge of the provincial jail. At present three provincial guards are employed at an expense of ₱15 each per month. Arms have been furnished the province by the constabulary regularly bonded. The province desired this arrangement previously, but owing to its poor financial condition was unable to afford it.

One of the heavy expenses to the province has been the feeding of prisoners, not only during the past year but in preceding years. The quiet condition existing now, and which existed for the past few months, has materially lowered the number of prisoners confined, and the fiscal year probably found the province out of debt, with some money in the treasury.

The new land tax met with favor in the province, and natives are daily registering their lands. The internal-revenue law was not at first understood, but is daily becoming more popular. Considerable difficulty has been encountered in the enforcement of the opium laws. Owing to the large number of Filipinos who use the drug in this province, much difficulty will be encountered in enforcing the law. The registration of cattle has progressed favorably, and now the majority of animals are registered.

The senior inspector reports that many people are settling on public lands without going through the formality required by law, and recommends that steps be taken to regulate this in order to avoid trouble at some future time. The senior inspector further states that a large number of landholders are timid about making application for titles, owing to the fact that property has descended from parents to children and has thus been divided into many small parcels. It is believed that the Commission has recently enacted legislation which will remedy this.

SCHOOLS.

The people are showing a marked improvement in their interest in their children attending school, and with the exception of Misamis all districts of the province have good schools with ample attendance. It is understood that Misamis is also getting into line and that schools will be established there, properly supervised, during the present year. The people, as a rule, are anxious to learn English. Some barrios are hostile to the schools, but on the whole educational prospects in the province are good. Religious matters do not seem to affect the schools materially. In districts which are strongest in the Catholic faith some have the best and some the poorest schools; the same might be said where the Aglipayanos are in the majority.

RELIGIOUS FEATURES.

There have been during the year many cases of infractions of the law and disturbances due to religious factions. It is not deemed advisable to go extensively into this question in this report. I, however, have submitted an extract from the annual report to me by the senior inspector of the province dealing with this and other subjects, for the information of the director of constabulary, with a view to his laying the matter before the governor-general, should he deem it advisable.

SPECIAL EVENTS.

No outlaw organizations at present exist in the province. Four outlaws who formerly took part in the disturbances of 1904 are still at large, but are committing no depredations. These are Luis Baludong, Ciriaco Gaila, Nicolas Magsalay, and Liberato Jabagat. They were members of a band led by Francisco Sipí and Gabriel Grubada during 1904 and were responsible for the murder of some forty-two natives.

Baludong is in the mountains of Molugan, and is armed with a Winchester rifle. The other three are in the mountains between Libay and Balingao, but are unarmed. We hope in time to capture these. No other arms than the one above mentioned are known to be in the hands of outlaws in the province.

During the year licenses have been issued to many people to possess firearms. These were arms which were in the hands of these people unknown to the authorities. The policy was adopted of allowing them to register them and obtain a license, and they were encouraged to do this—not that it was deemed advisable that they should have them, but it was deemed the only means by which we could ascertain who had arms in their possession. When their annual license expires, it is proposed to recommend taking up large numbers of these, as the possession of firearms in that province in the hands of private individuals is not necessary for their self-defense. During the year many old arms were taken away from people who had no license for them, and are stored in the ordnance storeroom at Cagayan. Sixteen of these were confiscated in one town.

EXPEDITIONS.

Exploring expeditions have been numerous during the year, made with a view to learning more of the interior and unexplored portion of the country. One of these was for the purpose of ascertaining whether or not there was a practical trail from Camp Keithley to Cagayan by route directly east as far as Sevilla without passing through that portion of the country in the vicinity of Lake Lanao (Maciu), which has at all times shown hostility to small parties. This trip was successfully made, but no continuous trail discovered.

An expedition south of Sevilla to the Río Grande was made. Nothing unusual discovered. It was noticed that the Jesuit padres are again taking up their mission work in the interior.

In November Captain Gallant, with Lieutenant Fortich and 25 men, made a trip to the headwaters of the Cagayan River, dispersing a number of montescos who had encamped there under some religious fanaticism. The party was fired upon when it approached. The fire was returned and the montescos scattered. One was killed. They made no further attempt to renew this craze. The senior inspector believes that if it was a scheme concocted by some of the "caciques" around Cagayan for personal gain. There is no proof, however, of this.

On November 28 an expedition was made to Guinting-Guinting, where a band of fanatical montescos had assembled. A short engagement took place, during which the leader, Roman, and five of the fanatics were killed. This completely broke up the organization, and there has been no trouble from it since.

An expedition was made also in November up the west bank of the Cagayan River to Mahaun, the highest point of the interior mountain range visible from Cagayan. From this point it is possible to descend into the interior down the mountain side to the Molopoli River, a branch of the Río Grande.

The provincial jail at this time contains a smaller number of prisoners than it has for years, there being but 17. It has averaged heretofore from 75 to 100. This speaks well for conditions and shows that the province is improving.

COURTS.

At the session of the court of first instance 34 prisoners were sentenced to more than two years, 28 for bandolerismo; a total of 58 were accused of bandolerismo; 1 was sentenced to death; the remainder from ten to thirty years.

MUNICIPAL POLICE.

The municipal police of the province number 27 in Mambajo, 25 in Cagayan, 21 in Talisayan, with 9 in some of the smaller towns. The efficiency is generally fair, uniforms good. They have been uniformed throughout the larger towns of the province during the past year. In some towns the police is made up largely of discharged scouts and constabulary, and with proper handling and training can be made very efficient. This is notably so in the town of Oroquieta. Mr. Paradies, the presidente, was formerly a soldier, and takes great pride in his police force. Owing to the wretched condition of the police and the disturbed condition of the province, the governor-general some time ago gave orders to disarm all the municipal police of the province. Since that time I have recommended and obtained approval for arming the police in Mambajo, Oroquieta, and Talisay, and it may later be extended to other towns, as it is believed the police are improving.

CONSTABULARY TRANSPORTATION.

The transportation in the province consists of 8 Australian and 5 native ponies, 1 carromata, 1 bull, 1 cart, and a sailboat. It is hoped that eventually a gasoline launch can be obtained, and then the west side of the province transferred back to Misamis Province, it being now attached to the district of Lanao.

At one time the governor of the Moro Province believed it advisable that the west side of Misamis be transferred to the Moro Province. I have no doubt it would have been the signal for more progress, but I tested the matter among the people as to how they felt. Many of them wished to do anything to get out from under the control of the provincial board of Misamis Province, but it was very soon ascertained that if left to a vote of the people the influential ones would dissuade them from voting to come into the Moro Province, from the fact that they would not control the revenues of their towns. No further action was taken in the matter.

I visited all the towns in Misamis Province, conversed with the presidentes and consejales, encouraged them in every way to look after the good order and progress of the province, to encourage schools, and to compel the attendance of their children. They were profuse in their promises, and it is believed that some good has been effected by these visits.

This report on Misamis Province has been extended beyond the limits which it should have been, but it seems necessary that steps be taken to try to make the province, which is one of the richest in the islands, more progressive than it has been heretofore. I am convinced that "caciquism" and political factions, together with religious dissensions, are the causes of its backward state.

PROVINCE OF SURIGAO.

Governor: Señor Rafael Elliott.

Senior inspector: Capt. Ole Waloe.

Troops: One company stationed at Surigao, with substation of 10 men at Talacogan, on the Agusan River. The only officer belonging to the company is Subinspector Escolastico Zapanta. Lieutenant Lattimore since his relief as supply officer has been temporarily attached to the company. Capt. Frederick Johnson, the former senior inspector, was in command of the company, but was away from his station so much that the company received but little attention, and on my second visit there I found that the company had run down very much and things in general presented a dilapidated appearance. Captain Johnson could not be blamed to any great extent, as conditions in the province required his attention away from Surigao so much that the efficiency of the company suffered in consequence. A careful inspection upon my last visit showed great improvement.

The company is composed almost entirely of reenlisted men, practically all of whom can read and write. The intelligence of the men is far ahead of any in the district and is equal to, if not above, that of the companies in Luzon. The men are practically all Visayans. Some are serving in the third enlistment.

Peace conditions are the best of any province in the Philippine Islands. The people are generally contented and making some progress. If the Catholic and Aglipay priests could be induced to refrain from religious contentions, the province would be near the millenium. The last vestige of bandolerismo disappeared with the recent capture of the remaining members of the band which murdered Captain Clark. I attribute the conditions very largely to the combined

tact and judgment of Governor Sison and Captain Waloe. The province unfortunately lost the services of the former through death from tuberculosis shortly after his reelection. His successor is following the same policy, and while he does not command the respect and enjoy the affection of the people that Sison did, he is making a good governor.

The province has the following transportation: 1 gasoline launch, 1 rowboat, 1 carromata, 2 ponies.

The launch is now in good repair, for the first time in eight months. It was an old launch when purchased, and ran for a long time from Surigao to the Agusan River (eight hours) and up that river (two days) until it refused to do duty. Its condition was such that we should feel gratified that it was not lost at sea, with all on board. An American engineer, who is also a good mechanic, now has charge of the launch, replacing a Filipino, whose ignorance of his duties was only exceeded by the apparent indifference of the official who was responsible for his retention. The vast distances in this province, together with the inability of the senior inspector to visit many parts of the province except by launch, makes its presence there a necessity.

The port has a fairly good wharf. Commercial steamers drawing 10 feet can discharge cargo at same.

It affords me great pleasure to report the satisfactory condition of this province.

I forwarded a very complete and interesting report of the various features of the province on November 30, 1905, prepared by Capt. Frederick Johnson while senior inspector.

GENERAL SERVICE COMPANY.

This company was stationed at Isabela when I arrived in the district. Upon the removal of the Third Company Zamboanga from Zamboanga to Calarian prison, the General Service Company was brought to Zamboanga for station. Later it was sent to Bongao in order to bring the Bongao Company to Zamboanga to be civilized. At the end of July the latter was returned to station after a six months' tour of duty at Zamboanga. The General Service Company returned to Zamboanga on August 4.

There has been but one officer for duty with this company during the year. Two officers should be at all times on duty with this company, since it is supposed to be ready at a moment's notice for field duty in any part of the district.

Capt. C. M. Sanford commanded it during part of the year. He finally went on leave. Later Capt. R. H. Poggi was assigned to its command, but was ordered out of the district. Later Capt. Frederick Johnson was assigned to temporary command of it. It will thus be seen that the company, for lack of permanent officers, has been an orphan.

The company is composed of a good class of men—Visayans and Zamboan-gueños, with a few Moros and Subanos. Most of the men speak some Spanish and more than half can sign the pay rolls.

Attached will be found appendices numbered from A to E,^a giving as far as possible tabulated data requested.

Very respectfully,

W. S. SCOTT,

Director Fifth Constabulary District.

The EXECUTIVE INSPECTOR.

Bureau of Constabulary, Manila, P. I.

^aThe following tables accompanying this report are on file in the War Department:

Appendix A.—Officers, stations, etc., field and staff, line, stations, and territory embraced.

Appendix B.—Expenses.

Appendix C.—Missing.

Appendix D.—Number of arms captured, animals recovered, expeditions and engagements, miles covered, constabulary and outlaws killed and wounded, etc.

Appendix E.—Municipal police, personnel and equipment, etc.

APPENDIX 6.

REPORT OF THE CHIEF SUPPLY OFFICER, BUREAU OF CONSTABULARY.

HEADQUARTERS BUREAU OF CONSTABULARY,
OFFICE OF THE CHIEF SUPPLY OFFICER,
Manila, August 1, 1906.

SIR: I have the honor to submit the following report covering the operations of this department for the year ending June 30, 1906:

DUTIES.

This office is charged with the preparation of estimates for appropriations for the bureau; with the purchase and requisition of supplies necessary to feed, clothe, arm, equip, and quarter the officers and enlisted men of the bureau; with providing medical attendance, treatment, and supplies; with furnishing transportation for our officers, enlisted men, employees, animals, and supplies between all points in the islands, and also all government supplies from Dagupan to Baguio and intermediate points; with the paying of salaries and wages of the personnel of the bureau and the settlement of all its obligations, and with conducting branch civil supply stores in the different provincial capitals. This work is carried on through 5 divisions and 35 supply officers, the latter being stationed in various provincial capitals throughout the archipelago.

PAYMASTER'S DIVISION.

This division, under the supervision of Capt. Arthur H. Thomas, was charged during the early part of the year with paying the salaries of officers and clerks in and around Manila and the wages of skilled and unskilled laborers employed by the bureau in this city; with the payment for all supplies delivered under contract or purchased in open market; with the payment of all transportation bills to the various transportation companies in the islands and to the bureau of navigation, and with the supplying of funds to the different district and provincial supply officers.

During the year, as shown by the detailed report of the paymaster herewith, this division disbursed ₱1,210,179.27 and transferred to the different supply officers ₱2,515,581.83.

During the latter part of the year a new system of paying salaries was inaugurated. This consisted of paying all officers and clerks of the entire bureau, regardless of where they are stationed, on pay rolls unsigned, but paid by check and the check number inserted instead of the signature. This centralizes one class of payments without any particular increase in the labor involved, makes the preparation of data easier and more authentic, and relieves the district supply officers of a great measure of their work, thus making them available for other duties, which until this time they have been unable to perform.

The work of this division has been most satisfactory during the year.

QUARTERMASTER'S DIVISION.

The transportation of all supplies from Manila to the different provinces and stations, the transportation of all government supplies from Dagupan to Baguio, the operation of the Benguet road stage line, the examination, storing and transfer of articles of clothing, equipage, stationery, and office supplies, animals, harness, vehicles, etc., are in direct charge of this division under the supervision of Capt. A. C. A. Bortels, whose detailed report is forwarded herewith.

Purchases of supplies necessary for this division have been made by this office either from the insular purchasing agent or from local merchants under contract, and in some instances, where the exigencies of the service made prompt delivery necessary, from local merchants in the open market. This latter method of purchasing, however, is not considered as a general business proposition to be the most economical for the government, and although this office has the authority under the law to purchase in case of emergency supplies in lots costing less than \$1,000 United States currency in the open market, the endeavor has been to use this authority as little as possible and only where the supplies could not otherwise be obtained with sufficient dispatch to meet the needs of the service.

The Quartermaster's, Ordnance, and Medical Departments of the United States Army have at times been called upon to assist us in filling rush orders, and have uniformly responded willingly, promptly, and with the most commendable endeavor to accommodate this branch of the insular government whenever possible.

With the experience of past years before us, we have found, generally, that supplies can be obtained from the insular purchasing agent more economically than from other sources, but it is equally true that certain classes of supplies can be obtained under contract more promptly and at less cost than from this branch of the Government. We have endeavored to purchase our supplies where the lowest prices could be obtained.

One objection to the present arrangement with the insular purchasing agent is here mentioned. Although requisitions are generally filled promptly, the supplies frequently are not billed to this bureau for a month or even more. As the efficiency of this department largely depends upon its mobility, we frequently have to change supply officers from one station to another after they have received supplies from the insular purchasing agent, but before the invoices are received. This involves some confusion and complication in the proper rendering of accounts.

One of the most important functions of the quartermaster's division is the making of uniforms. During the year a contract was entered into by which we secured the manufacture of uniforms at 85 centavos per suit, this bureau furnishing 5½ yards of khaki and the contractor furnishing the necessary labor, thread, buttons, piping, etc. For the coming year a contract has been entered into with Bilibid prison for the manufacture of these uniforms at the same figure.

One of the heaviest expenditures of this bureau is for the transportation of officers, employees, and supplies. This involves the hire of trucks, wagons, carromatas, carretelas, and so on, from the city of Manila; the hire of coast-guard cutters and smaller launches from the bureau of navigation, and the payment to commercial firms for land and water transportation. In addition to these items this bureau during the year operated four of its own launches and purchased and cared for numerous animals and vehicles; a statement showing the number of which may be seen in the report of the quartermaster herewith.

For forage from the insular purchasing agent alone, which includes only hay, straw, and oats, ₱94,852 was expended. This does not include the purchase of grass and palay for animals stationed in remote points throughout the archipelago.

One hundred and twelve thousand four hundred and sixty pesos were paid to the bureau of navigation for the hire of cutters and launches for the use of this bureau only. As has been before mentioned, the efficiency of this bureau largely depends on its ability to rapidly change from one scene of operations to another, and the smaller the personnel the greater the necessity for mobility.

In the report of the quartermaster itemized statements showing the cost of transportation of supplies, officers, enlisted men, and employees are clearly given.

The amount paid by this bureau to the bureau of navigation during the year was refunded to us upon authority contained in the resolution of the Philippine Commission dated June 26, 1906.

The hire of transportation from the municipal government of the city of Manila alone cost the bureau during the year ₱14,100.

The stage line put into operation on the Benguet road during the fiscal year 1905 has continued to render good service to the officials and employees of all branches of the government, as well as private individuals. This stage line, however, was not operated for the transportation of freight. The shipment of supplies was handled under contract by Mr. C. M. Jenkins, of Dagupan, when the Benguet road was opened to transportation. During the heavy rains, however, when the road was impassable, freight had to be transported by pack train from Camp Four. This pack train rendered efficient service to all branches of the government. One of the most marked improvements in the passenger service was the new style of wagons adopted. This had made travel more comfortable and economical to the government. During the year the fare from Dagupan to Baguio was reduced from ₱25 to ₱20, and a new stage-line ticket system was inaugurated, which has resulted most satisfactorily. In the quartermaster's report will be found a complete statement of the charges made in the stage line and pack train and a detailed account of the receipts and expenditures of this branch of the service.

MEDICAL DIVISION.

This division is under the direction of Capt. and Surg. Thomas C. Walker. During the year 7 hospitals have been put upon a working basis, at points shown in the report of the superintendent of the medical division herewith:

During the year 1,541 patients have been treated in these hospitals, and 1,062 patients have been treated in quarters. Act No. 1416 provided for a reduction of nearly 50 per cent of the enlisted personnel of the medical division. However, the improved grade of medical officers, resulting from the increased compensation authorized for these positions in the same act, has enabled us to sustain this loss without as much inconvenience as was expected.

During the latter part of the year the advisability of transferring this branch of our service to the bureau of health was considered. It was finally decided to allow us to retain this division—a decision affording us much satisfaction. With our officers and men in the field facing armed and organized hostile bands, with the probability of wounds being received, and with the certainty of sickness resulting from exposure and improper food and water, it is absolutely necessary that our medical officers and men accompany our fighting forces.

The medical division during the past year has carried out efficiently the object for which it was organized.

ORDNANCE DIVISION.

This division, under the supervision of Capt. John R. Schultz, is charged with storing and accounting for arms, ammunition, and equipments, and with providing the organizations in the provinces with these supplies. It is also charged with the manufacture of horse equipments and the repair and preservation of arms, ammunition, and equipments.

During the year there was repaired in the armory of this division small arms aggregating a total of 3,402; canteens, saddles, bridles, etc., 976; there were manufactured various horse equipments numbering 1,568, and some 4,500 small arms were cleaned, repaired, and oiled, but not blued. In addition to this work, many small items of repair and manufacture which can not be classified were also completed.

The powder magazine, which until June 18, 1906, was under the charge of this office, was on that date transferred to the bureau of supply. This bureau continues, however, to furnish the guard for this building.

Shortly after January 1, 1906, the advisability of having constabulary arms and equipments manufactured and repaired at the Manila ordnance depot was considered. After some correspondence, which is shown in the report of the ordnance officer, it was decided that with the end of the fiscal year our ordnance repair shop would be abolished. This made unnecessary the services of several mechanics, saddlers, and unskilled laborers, aggregating a total cost of some ₱10,000 per annum, and the necessity for the continuation of a separate division ceased. This division with the beginning of the new fiscal year was consolidated with that of the commissary. It is believed that a saving of at least ₱5,000 a year will result from this consolidation.

In April authority was obtained for the purchase of 500 Krag carbines, with the necessary ammunition and belts, and 300 of these were purchased and have since been issued. This was the first move in the plan to rearm the enlisted men of this bureau with the modern magazine carbines. As rapidly as the financial condition will allow and the approval of the proper authorities can be obtained, the rearming process will continue.

During the year the ordnance division has promptly supplied the demands made upon it.

COMMISSARY DIVISION.

This division, under the supervision of Capt. Asa F. Fisk, until December 31, 1905, was charged with the operation of a civil supply depot in Manila, 52 branch civil supply stores stationed in the various provincial capitals, and with accounting for the stores received, transferred, and sold.

The conditions in many of the provinces during the first half of the year had improved to such an extent commercially that, upon the recommendation of the reorganization committee, instructions for the discontinuance of the civil-supply store in Manila were embodied in act No. 1416, and practically the entire commissary division of this bureau was transferred to the bureau of supply on January 1, 1906.

The branch civil-supply stores in the provinces continued in operation under the management of constabulary supply officers. Captain Fisk was retained by this bureau to supervise the work of the supply officers in charge of these branch stores and to carry out the policy of the bureau in reducing their number. Since the date of the transfer to the bureau of supply it has been found practicable to discontinue eighteen branch civil supply stores in as many provincial capitals. Several others are now allowing their stock to run down with a view to their being abandoned. As rapidly as the circumstances will permit and provincial merchants are able to handle the necessary stocks others will be discontinued.

On June 30 there was a remaining surplus of ₱37,571.95, which, should the government so desire, would allow it to close out its entire stock on hand, both in the depot of the bureau of supply and in all the provincial branch stores, at 75 per cent of its cost and still have its original investment intact. When the heavy drain upon the original investment for transportation has been considered and the fact that in this climate tinned goods deteriorate rapidly, it is believed that these figures speak highly for the efficient manner in which the affairs of this division have been administered. The report of the commissary officer herewith gives the details of its transactions during the year.

Owing to the discontinuance of the eighteen supply stores above mentioned and the necessity for closing out at less than cost price the damaged and unsalable supplies, it was found necessary to cut into the surplus to the extent of ₱5,948.10, which represents the loss under which the division operated during the year.

With the decreased number of branch supply stores and the transfer of the depot in Manila to the bureau of supply, and the transfer of our repair work from our ordnance shop to the military ordnance depot, it has been found unnecessary to maintain separately the ordnance and the commissary divisions. With the close of the year these were consolidated into one division known as the commissary and ordnance division, under the supervision of Captain Fisk.

TELEGRAPH DIVISION.

At the beginning of the year this division, under the supervision of Capt. Rush P. Wheat, had charge of all the telegraph, telephone, and cable lines belonging to the insular government and the construction of new lines and the maintenance and repair of those already in existence. This division, operating at a cost of ₱391,973 for the fiscal year 1905, could hardly be considered a proper part of the cost of the constabulary. This was early seen by the reorganization committee, and, upon its recommendation, this division, with its large personnel of officers, operators, linemen, and laborers, was transferred to the bureau of posts on January 1, 1906.

SUPPLY OFFICERS.

During the fiscal year 1905 provision was made for the paying of extra compensation to constabulary officers detailed as supply officers. There were in all 52 of these. That this was a wise provision has been amply demonstrated during the past year, in which it has been found practicable to reduce the number of these officers from 52 to 35 at the close of the year. This large decrease in force has been due to several causes, among which might be mentioned the increased efficiency of its personnel, made possible by the extra compensation authorized in act No. 1416, the more peaceful conditions obtaining in several of the provinces, the more thorough systematization of the work, and the better transportation facilities. The work of consolidation is still going on wherever possible, and it is believed that, with each ensuing year, this branch of the bureau will be operated at a decreased cost. The duties of a supply officer are many and varied, and it is gratifying to be able to state that during the entire year there has been no case of malfeasance in office.

ROUTINE WORK.

Several changes in the routine work of the department have been made during the year, in the early part of which the records of the entire headquarters were centralized in one office. After a practical test of more than six months this plan was given up as cumbersome and unsatisfactory, entailing loss of time without decrease in expense. The records of the supply department are now handled in this office satisfactorily at no increased cost to the government, this work having been distributed among clerks of the office, in addition to their other duties.

Another change made, which it is believed will result in a more efficient service, is the passing of supply officers' accounts through this office on their way to the auditor. By this means each supply officer's account is given thorough scrutiny, with a view to notifying him of exorbitant or erroneous payments, and this office is kept in direct touch with all the expenditures of the bureau wherever they are made. This change, although put into effect during the latter part of the year, is already demonstrating its usefulness both as an economical measure and as a guide to supply officers.

The bonding of company commanders and making them accountable for the ordnance property issued to their commands is another change which has resulted in decreasing the work of the supply officer without materially increasing the duties of the company commander, and has also resulted in a more prompt and careful accounting of the ordnance stores of the bureau.

Means of transportation, although still accounted for by the various provincial supply officers, are now under the direct supervision of senior inspectors. This has resulted in greater care being taken of our animals and vehicles and a decrease in the cost of transporting supplies.

PERSONNEL.

At the beginning of the year the personnel of this office consisted of Col. D. J. Baker, jr., chief supply officer; Capt. H. B. Harpold, assistant chief supply officer; Mr. Harvey S. Dye, clerk, class 7; Mr. Ward E. Favorite, clerk, class 7; Mr. J. P. Quander, jr., clerk, class 8; Mr. Robert G. Woods, clerk, class 8, and Mr. Harry Johnston, clerk, class 9. For the first few months of the year Col. D. J. Baker, jr., was on detached service in charge of the provisional district, and the office was in charge of Capt. H. B. Harpold, assistant chief supply officer. On January 25, 1906, the undersigned was detailed acting chief supply officer and assumed the duties of that position the same date. Shortly after this the assistant chief supply officer was ordered to Iloilo in connection with duty on a board of which he was a member for preparing new regulations. While away from his station on this detail, Capt. A. J. Robertson, paymaster, returned from leave of absence in the United States and was detailed as acting assistant chief supply officer, and, upon the resignation of Captain Harpold, on May 31, was appointed assistant chief supply officer.

That the bureau has been promptly and well supplied and that the demands upon it, within the limited means of the constabulary appropriation, have been successfully and promptly met, is mainly due to the marked ability of the assistant chief supply officer, Captain Robertson; to the efficient organization of the different divisions, and to the earnest and hearty cooperation of their chiefs, namely, Captains Fisk, Schultz, Walker, Bortels, and Thomas, all of whom are commended for your consideration.

Respectfully submitted.

MARK L. HERSEY,
Acting Chief Supply Officer.

The EXECUTIVE INSPECTOR,
Bureau of Constabulary, Manila, P. I.

BUREAU OF CONSTABULARY,
COMMISSARY DIVISION,
Manila, August 3, 1906.

SIR: I have the honor to submit the following report covering the operations of this division during the fiscal year 1906:

The handling of the commissary through its life has been an interesting work. The building up of a surplus in cash or earnings from the slender 10 per cent surcharge and keeping the loss by deterioration and cost of transportation below that mark was a task that required constant attention and care.

The life, however, is almost at an end. The necessity of continuing stores in many of the provinces is past, due to the natural revival of commerce and trade in certain centers and the competition of commercial houses entering the field. How well the commissary or civil supply stores have met the necessity that brought about their being I leave others, who were dependent upon them for the necessities of life, to say. It is a hard matter to conduct a purely commercial

business such as this has been along the straight, rigid lines laid down by government equity and regulations.

A merchant finding undesirable stock on his shelves reduces the price and makes up whatever loss occurs by increasing the price on some "ready seller." Such reduction in the commissary, however, meant just that much dead loss either in earnings or in original capital.

The closing out or death of the division, or limiting branch commissaries to remote island provinces or out-of-the-way ports, is rather hard to witness after organizing and managing it through its prime.

The concern reached its zenith during the first half of the fiscal year 1905, when the net earnings or surplus amounted to ₱46,685.79. Since then there has been a steady decline. Not only has all of the surcharge been used by the running expenses, deterioration, and other losses, but some of the net earnings from previous periods have been put to this use until at the close of this fiscal year the surplus of only ₱37,571.95 remains. (See exhibit B.)^a

The doing away with the old Form 4 (inventory report) in March and the failure of a number of supply officers to keep this office informed of commissary transactions made the task of compiling the tabulated statements attached a very difficult one.

Balancing the accounts, however, for the fiscal year, the stock on hand June 30, with purchases, transfers, sales, etc., debited and credited, show a debit unexplained difference of only ₱11.

The net loss in savings for the year is ₱5,948.10. Of this amount ₱3,466.94 occurred during the last six months, or since December 31, 1905. (Exhibit B.)^a

The deterioration amounted to 6.61 per cent and the cost of transportation to 5.81 per cent on actual sales, or a total of 12.42 per cent. (See exhibit C.)^b

This, taken on actual sales of ₱306,094.65, should net a loss of ₱7,407.49, if all of the sales had been made at invoice price. The difference between the actual loss of ₱5,948.10 and that of the percentage loss figures, ₱7,407.49, is covered by stores which were credited to the accounts of different supply officers on June 30, 1905, as damaged, but which were actually destroyed during 1906 and recharged.

Considering that practically 18 branch commissaries have been closed during the fiscal year, and that the old shop-worn and partly damaged stock has been sold at a very low figure, while many other sales have been made less the 10 per cent surcharge, the loss is an exceptionally small one.

With the remaining surplus of ₱37,571.95 on hand the government could close out its entire stock, both on hand in the depot of the bureau of supply and in our provincial commissaries at 75 centavos on the peso and still have the original investment intact.

Of the 37 branch commissaries in existence June 30, 1905, 13 have been actually closed, and Cavite, Laguna, Pangasinan, Surigao, and Zamboanga, 5 others, have been practically closed out. One other, Cuyo, Palawan, does only a brokerage business—that is, secures stores in lots which are disposed of promptly on delivery, and there is no loss by deterioration or other causes.

As the present idea is to close out the commissaries wherever possible, it is recommended that this be done as gradually as possible to avoid any heavy losses by reduction sales. Further, that all provinces such as Antique, Benguet, Neuva, Vizcaya, Lepanto-Bontoc, and such others where it may be necessary to still furnish subsistence to civil employees, be placed on the same footing as Palawan, i. e., the supply officer to make monthly requisition for only such stores as the employee will guarantee to take off his hands promptly on receipt, each employee to furnish a list of what he requires at least two months in advance to insure prompt delivery, the supply officer to act only as an agent in such transactions, receiving payments and accounting for and depositing the funds received. While the transportation may cost a little more when not shipped in case lots, the gain, by having no deterioration and in handling, will be much greater.

From now on there will be a more or less steady loss, as the heavy cost of transportation and loss by deterioration in the few remaining provinces exceeds the permitted surcharge of 10 per cent.

The most economical plan for the government to follow out along this line would be to close all commissaries as soon as practicable and allow commercial

^a Exhibit B is on file in the War Department.

^b Exhibit C is on file in the War Department.

houses to enter the field in these remote provinces. An increase in pay of all employees of, say, from 5 to 10 per cent, to cover the additional cost of living in such provinces, should be made. Should the local merchant then attempt extortion the Manila markets are always open, and by getting their supplies direct and paying the transportation and other charges themselves the merchant would naturally be forced to be satisfied with a fair margin. This suggestion may be premature, but the closing of all the provincial stores must eventually be made along some such line, and it is made for what it is worth.

Respectfully submitted.

ASA F. FISK,
Constabulary Commissary.

The CHIEF SUPPLY OFFICER,
Bureau of Constabulary, Manila, P. I.

NOTE.—The following tables accompanying this report are on file in the War Department:

Exhibit A.—Statement showing the financial condition of the commissary division, bureau of constabulary.

Exhibit B.—Statement showing the financial condition of the commissary division, bureau of constabulary.

Exhibit C.—Statistical report showing sales, losses, and cost of transportation.

Exhibit D.—Statistical report of stock and cash on hand in the provincial commissaries.

Abstract of accounts; defaulting officers' accounts.

Statistical statement showing purchases, transfers, and sales.

BUREAU OF CONSTABULARY, ORDNANCE DIVISION,
Manila, P. I., July 28, 1906.

SIR: In compliance with your instructions under date of June 25, 1906, I have the honor to submit the following report on the principal operations of the ordnance division of the bureau of constabulary during the past fiscal year.

On account of the rapid deterioration of equipments in this climate, the wearing off of bluing on arms, and the loss of parts, due to long and arduous service these guns have been put through, the work of this division has been constantly on the increase in order that equipments and arms be kept in a serviceable state.

In the early part of the fiscal year negotiations were entered into with the military authorities with a view of purchasing all ordnance and ordnance stores for use of the constabulary direct from the Manila ordnance depot. This would avoid the necessity of carrying a large stock on hand and also reduce the cost price of stores from 8 to 10 per cent. On October 25, 1905, the Secretary of War, in the following cablegram to the division commander, authorized the sale of ordnance and ordnance stores to the constabulary:

“Wood, Manila.

“Referring to cablegram from this office of the 4th instant, supplies of articles such as are issued to the Army can be sold to the insular government from ordnance depot for use constabulary, provided division commander thinks such supplies can be supplied at the time, and that no cannon or machine guns be transferred without authority of the War Department.

(Signed)

“AINSWORTH.”

The reorganization committee appointed by the honorable the governor-general under date of April 1, 1905, recommended that the workshops of this division be abolished and that such work be done by the Manila ordnance depot.^a

The powder magazine at San Juan del Monte, which was previously under the charge of this office, was, on June 18, 1906, taken over by the bureau of supply. The constabulary continues to furnish the guard for this building.

ISSUES AND RECEIPTS OF STORES.

During this period the number of requisitions received at this office amounted to 210. The number of issues of ordnance stores for this period amounted to 196, and the total number of receipts to 142. The ordnance office has responded

^a The correspondence on this subject is on file in the War Department.

most liberally to all demands made, and has supplied requisite stores as promptly as possible. No serious complaints have been received from troops of failure to supply them promptly.

In filling requisitions, the policy of keeping each province fully equipped was followed. In every case where an officer reported in his requisition a large number of unserviceable articles on hand, he was required to explain the reason for not placing them before an inspector. In no case was a request for stores returned to an officer because it had not been made on proper blanks or had not gone through all the channels. When a requisition was received direct, it was immediately remailed to the district director for his approval.

REPORT OF WORK DONE IN SHOPS OF ORDNANCE DIVISION.^a

Mr. J. C. Winebrenner, armorer, has had immediate charge of all workshops and all work during this entire period. In addition to his duties as armorer, he has had charge of all storerooms, receiving and packing of stores. He has shown marked ability in these duties, and his energy and efficiency have told in the improved condition of storerooms and the arrangement of stores. His ability as armorer has been conspicuous throughout.

Respectfully submitted.

JOHN R. SCHULTZ.

The CHIEF SUPPLY OFFICER,
Bureau of Constabulary, Manila, P. I.

BUREAU OF CONSTABULARY,
OFFICE OF THE PAYMASTER,
Manila, P. I., July 31, 1906.

SIR: In compliance with instructions from your office, dated June 25, 1906, I have the honor to submit herewith my report of the business of this office for the fiscal year ending June 30, 1906.

DUTIES.

This office is charged with obtaining from the insular treasurer, upon requisition, as needed, moneys appropriated for the bureau of constabulary; with the transferring, in cash or by deposit in the insular treasury, funds necessary for disbursement by district and provincial supply officers; with the payment of officers and employees at Manila, as well as all officials and employees of this bureau appointed under the provisions of acts No. 619 and No. 1040, as required, and all other obligations incurred for supplies furnished and services performed for the bureau; and with accounting to the auditor, in accordance with law, for all funds handled by this office.

During the month of August the paymaster was granted leave of absence to visit the United States, and on August 28 the undersigned was appointed acting paymaster, serving in that capacity until June 1, 1906, when I was appointed to my present position.

PAYMENTS.

In addition to the usual disbursements of funds, an immense amount of correspondence passes through this office, over 4,000 communications having been received and 3,200 sent. Four thousand five hundred vouchers, aggregating the sum of ₱1,210,179.27, were paid during the fiscal year.

On January 1, 1906, the telegraph division was transferred to the bureau of posts and the constabulary commissary to the bureau of supply. Since that date the number of vouchers has greatly diminished, owing to the fact that the respective bureaus pay for the purchases made for these divisions through their own disbursing officers.

Every effort has been made to settle the obligations of this bureau with care and promptitude, and the undersigned is proud to record that in no single instance has there been a complaint made against this office for either error in computation or tardiness in settlement. Officers and employees paid by this office have uniformly received their salaries on the last day of the month, while commercial and other obligations are liquidated promptly following the rendition of properly approved vouchers.

^a Details of work done accompany this report and are on file in the War Department.

TRANSFERS.

During the fiscal year, 476 transfers were made to supply officers, of which ₱1,981,679.63 was by deposit, and ₱533,902.20 by shipments of cash, making a grand total of ₱2,515,581.83 transferred. As a rule all transfers to supply officers are completed by the 25th of the month preceding the month for which the funds are required.^a

Respectfully submitted.

A. H. THOMAS,

Captain and Paymaster, Philippine Constabulary.

The CHIEF SUPPLY OFFICER,

Bureau of Constabulary, Manila, P. I.

BUREAU OF CONSTABULARY.

OFFICE OF THE QUARTERMASTER,

Manila, P. I., August 1, 1906.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1906:

DUTIES.

The quartermaster division, which is conducted under the general direction and supervision of the chief supply officer, bureau of constabulary, is charged with various duties, the principal of which are:

First. The receiving, inspecting, and accounting for all quartermaster supplies purchased by the chief supply officer upon estimates submitted by the quartermaster.

Second. The judicious distribution of such supplies to the various district and provincial supply officers and the medical officers stationed throughout the islands.

Third. The providing of transportation out of Manila for officers, enlisted men, and employees, and the shipping and providing of transportation for not alone quartermaster supplies, but also all supplies of the commissary division, the ordnance division, the paymaster division, and the medical division.

Fourth. The providing of transportation for passengers and freight of all bureaus and offices of the government of the Philippine Islands over the Benguet road.

Fifth. The settlement and preparation of vouchers for all bills covering persons transported on "transportation requests," on freight carried on "bills of lading," including not alone such "requests" or "bills of lading" issued by the quartermaster, but also those issued by the various supply officers in the provinces.

PERSONNEL.^b

To enable the quartermaster to properly carry on the extensive work of his division the following officers have been detailed by the director of constabulary as assistants to the quartermaster: Second Lieut. A. S. Ashe, Third Lieut. John P. Doak.

The former is stationed at Dagupan, representing the quartermaster, and has immediate charge of all transportation matters concerning the Benguet road.

The nature of this officer's duties requires a separate accountability. He has therefore been detailed an assistant supply officer and made a bonded officer.

The latter is stationed in Manila and has been placed in immediate charge of all matter concerning the transportation of supplies, etc., within the city, as well as those going to the provinces.

CITY TRANSPORTATION.

During the past twelve months all land transportation needed by the quartermaster in Manila was hired from the city of Manila.^c

^a Tables showing disbursements and transfers accompany this report and are on file in the War Department.

^b List accompanying this report is on file in the War Department.

^c Tables on file in the War Department.

This transportation was used in hauling supplies to and from railway depot, to and from vessels in the Pasig River, and to and from our lighter. The carromatas were used by the director of constabulary, the director of the first constabulary district, the chief supply officer, the superintendent information division, the quartermaster and the director of the constabulary school. The above-cited officials have considerable traveling to do in the city that can not well be covered by street cars.

From the above table it will be seen that during the last six months of the period in question the cost of city land transportation was reduced by ₱258.69. This was made possible by the completion of the new dock and dredging of the estero in the rear of our bodegas. Our cargo boat is now able to come alongside the bodega and take supplies direct to vessels in the river or the bay. Such supplies had formerly first to be loaded in wagons and hauled to the lighter or cargo boat at the Bridge of Spain.

A considerably greater saving than ₱258.69 could have been made had it not been necessary to hire two extra carromatas during the last six months for regular service, one for the director of the first district and one for the director of the constabulary school.

A further reduction has been made effective July 1, 1906, and it is believed that during the coming twelve months the total cost of city land transportation can be held well within the sum of ₱10,000. As a whole the service rendered by the city was quite satisfactory.^a

The means of transportation owned by the constabulary on June 30, 1906, is shown in the following table, which has been compiled from special reports from the several supply officers:

Animals:

Bullocks	23
Carabaos	28
Horses—	
American	21
Australian	47
Chino	75
Native	208
Mules—	
American	9
Chino	102

Vehicles:

Ambulances	2
Calesines	2
Carretelas	43
Carretones	51
Carromatas	25
Quileces	4
Wagons—	
Escort	6
Light spring	23
Mountain spring	4

Vessels:

Bancas	8
Boats—	
Boarding	5
Cargo	19
Row	13
Sail	12
Whale	3
Launches, gasoline	4
Lighters	1
Virayas	3

The cost of cutters and launches hired from the bureau of navigation during the year amounted to ₱112,460.

The cutters hired were the *Busuanga*, for ten days each month during the first half of the year, and the *Ranger* and the *Rover* during the entire year. The launches *Philadelphia*, *Troy*, *Cabra*, and *Malecon* were hired a large portion of the year for use in the provinces. No launches have been hired regularly for use in Manila.

^aStatement of shipments made by this division accompany this report and are on file in the War Department.

PASSENGERS.

The following table shows the number of transportation requests issued during the year by the quartermaster and the supply officer in the provinces, together with the number of first, second, and third class fares and total cost:

	Fares.			Number of requests issued.	Cost.
	First-class.	Second-class.	Third-class.		
Coast guard boats	384	.....	2,999	779	₱23,860.55
Commercial boats	273	9	1,569	697	17,840.88
Railway	704	14	2,038	985	4,899.40
Total	1,361	23	6,606	2,461	46,600.83

All bills for the transportation outlined in the above table have been settled by this division.

BENGUET STAGE LINE, PACK TRAIN, AND FREIGHT SERVICE.

The complicated and unsatisfactory coupon system was abolished during March, 1906, and substituted by the plain and simple stage line ticket system. This ticket system has since worked to the entire satisfaction of both passengers and government. At the same time the fares were reduced from ₱25 to ₱20 in order to still further popularize Baguio. In May, 1906, the old spring wagons were replaced by our new "10-passenger" Studebaker mountain spring wagons, thus adding to the earning power of the line and the comfort of the passengers.

During four months of the period in question the stage line and freight service was interrupted owing to landslides on the upper part of the road, due to the heavy raining season experienced last year. It is during such time as this that the pack train is put into service between Camp Four and Baguio, packing by way of the Kias Hill trail.

The following tariff of charges for the transportation of passengers on the stage line between Dagupan and Baguio and for the transportation of government supplies over the same route was in force during the twelve months ending June 30, 1906:

Fares.

Direct:

Dagupan to Twin Peaks	₱10.00
Twin Peaks to Baguio	10.00
Baguio to Twin Peaks	10.00
Twin Peaks to Dagupan	10.00

Intermediate points:

Between Dagupan and Mangaldan, in either direction	1.60
Between Mangaldan and San Jacinto, in either direction .....	.60
Between San Jacinto and Manoag, in either direction	1.20
Between Manoag and Pozorrubio, in either direction	2.20
Between Pozorrubio and Twin Peaks, in either direction	4.40

Total Dagupan to Twin Peaks or return	10.00
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Between Twin Peaks and Camp Four, in either direction	3.70
Between Camp Four and Baguio, in either direction	6.30

Total Twin Peaks to Baguio or return	10.00
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Freight rates.

Direct:

	Per pound.
Dagupan to Camp Four	₱0.02
Camp Four to Baguio02
Baguio to Camp Four .....	.02
Camp Four to Dagupan .....	.02

Intermediate points:	Per pound.
Between Dagupan and Pozorrubio, in either direction-----	.0075
Between Pozorrubio and Twin Peaks, in either direction-----	.0075
Between Twin Peaks and Camp Four, in either direction-----	.0050
Total Dagupan to Camp Four or return-----	.02
Between Camp Four and Camp Colgan, in either direction-----	.01
Between Camp Colgan and Baguio, in either direction-----	.01
Total Camp Four to Baguio or return-----	.02

Passengers are allowed to carry free on the stage line hand baggage not exceeding 50 pounds in weight. Excess baggage will be charged at the regular freight rates in force between Dagupan and Baguio.

The following is the report of the officer in charge of the Benguet stage line, pack train, and freight service, and that of the veterinarian:

OFFICE OF THE TRANSPORTATION OFFICER,
CONSTABULARY STAGE LINE,
Dagupan, P. I., July 19, 1906.

SIR: I have the honor to submit the following report of the operations of the stage line and pack train for the fiscal year 1906, just ended:

During the past year the stage line was in operation for about eight months, being suspended four months during the heavy rainy season, at which time the upper portion of the Benguet road was closed with landslides. At the time the road was closed for staging and road traffic the pack train was put in operation, packing from Camp Four over the Kias trail to Baguio.

ROADS.

The roads traversed by the stage line from Dagupan, the terminus of the Manila Railroad, to Baguio, Benguet Province, are in much better condition this season than any in the past, and may be looked to improve from year to year. But this is not to be inferred that the present condition is satisfactory, for commencing at Dagupan it passes through a low, flat country, which is mostly under water during the rainy season, and is frightfully dusty during the dry part of the year. After traveling for 18 miles through the lowlands the rolling hills are reached, where conditions become changed for the better, and on entering the Bued River canyon the road becomes quite mountainous. The roadbed lies along both sides of the canyon, necessitating the crossing and recrossing of the Bued River about eight times over suspension bridges, finally reaching Baguio over a "zigzag" road, which is about 5 miles in distance and very steep. From the mouth of the canyon to Baguio the roadbed is in good condition, but subject to being temporarily closed during the rainy season with landslides; but as the travel is but little during these months scarcely any inconvenience is caused by the slides, as the road laborers are expert in cleaning and repairing the road at such times.

STAGE ANIMALS.

The class of draft animals required for the stages have to be carefully selected and trained for the special work needed of them, as the road changes in its terrain every few miles.

Mules have so far given the best satisfaction, particularly so from the mouth of the canyon to Baguio, where the suspension bridges and precipitous places are met with. The average number of animals required throughout the year is forty, but a reserve of ten should be kept on hand, as slight ailments are to be expected in handling traffic of this nature. The animals used during the past season finished their work in excellent condition and should reasonably be relied on to serve another year or two. The Chinese ponies did not do as well as the mules, being very prone to stiffness and subject to laminitis (horse founder).

They are better adapted to slow draft work than the faster gait necessary for staging.

VEHICLES.

On the opening of the last season light farm wagons were used as stages, but they did not give entire satisfaction, their construction not being strong enough, their bolts continuously getting loose, causing them to shake, rattle, and wobble like "rattletraps," causing no end of complaint from travelers. But

after the arrival of the new mountain spring wagons things changed for the better, and so far these wagons have given entire satisfaction. Their seating capacity is for ten passengers other than the driver, and considerable more baggage can be carried than by the farm wagons. In my opinion no further changes of vehicles will be needed for this class of transportation. On these wagons four-line teams are used, but when loaded to full seating capacity six animals should be used, for, in my opinion, four chino mules are not strong enough to handle them at such times.

RELAY STATIONS.

In order to make fair and to keep the stock in good condition, three relay stations are established along the road. From Dagupan to Pozorrubio, 18 miles, is the first stop, but this distance is too long to give the best results, but circumstances were such that it was deemed best not to make changes during the past season; from Pozorrubio to Twin Peaks, the second relay station, is 16 miles, on which run the animals have held up better than on run No. 1, and from Twin Peaks to Colgans, a distance of 11 miles, the animals have done remarkably well. Nipa houses, or sheds, are used for stables at all the stations, and they are supervised by Filipinos, and it is gratifying to say they have proved efficient in their work and their services have been very satisfactory.

THE VETERINARIAN.

The services of the veterinarian on duty at this station has been most satisfactory. Owing to the malignant fevers and diseases which attack live stock in this country, an isolated veterinarian hospital is established. As soon as an animal needs treatment or is a "suspect" of a contagious or fatal disease, it is dispatched without delay to the hospital. In my opinion the presence of a veterinarian is absolutely needed at this station as long as the present number of animals are in use. For further information regarding veterinarians attention is invited to his report.

SCHEDULE AND FARES.

During the "open season" stages leave Dagupan daily at 6 a. m., arriving at Twin Peaks 12 m. Leaving Twin Peaks 1.30 p. m., arriving at Baguio 6 p. m. On return trip from Baguio stages leave 7 a. m., arriving Twin Peaks 12m. Leaving Twin Peaks 1.30 p. m., arriving at Dagupan 7 a. m. The fare from Dagupan to Baguio, either way, is ₱20, charges being made for intermediate points.

TRAFFIC—EXCESS BAGGAGE.

The amount of business transacted by the stage line during the fiscal year just ended was—

Fares	₱4, 930. 20
Excess baggage	422. 74
Total	5, 352. 94

Owing to the long haul of 50 miles from Dagupan to Baguio the hauling of the excess baggage gave considerable annoyance to the traveling public, as it had to be transported by escort wagons, which usually took from two to four days' time.

Improvement can be made in this line by substituting lighter wagons and furnishing more in numbers than heretofore used.

PERSONNEL.

One veterinarian	per annum...	\$1, 600. 00
One blacksmith	per diem...	₱6. 00
Two teamsters	do.....	5. 50
Four teamsters	do.....	4. 75
Four drivers (native)	do.....	1. 50
Ten laborers (native)	do.....	1. 00

TRANSPORTATION ON HAND.

Studebaker mountain wagons-----	4
Studebaker light wagons-----	2
Escort wagons-----	2
Mules, chino-----	40
Mules, chino pack-----	15
Horses, chino-----	5

In conjunction with the duties of managing the stage line and pack train the undersigned transships all government freight from Dagupan to Benguet and Nueva Vizcaya provinces, having handled during the past year a total of 818,138 pounds. For particulars of same attention is invited to report on "Freight transported for government bureaus."

Your attention is respectfully invited to the fact that in eight months of staging not a single accident occurred, which speaks very highly for the teamsters, as the road through the Bued River canyon is anything but an easy one to drive four or more line teams over.

In concluding I wish to say that the condition of the wagons, draft animals, harness, stables, and things pertaining to the stage line are in excellent condition and should run without friction the ensuing year.

PACK TRAIN.

The pack train was organized with the object of keeping open for freight communication between Dagupan and Baguio, there being at that time no open road from Camp Four on the Benguet road to Baguio, travel being done over steep mountain trails. As the Benguet road was nearing its completion the pack train was less in demand, but owing to existing circumstances it was necessary to keep it in readiness for emergencies. Commencing with the first heavy rains the train was started, ending its labors after four months work

STATIONS—TRAILS.

Camp Four was used as the headquarters of the train, packing from there over the Kias trail to Baguio, a distance of 15 miles. This trail is one of the many zigzags, rising from an elevation of 2,000 feet to 5,000 feet in traversing the first 3 miles. From the summit of the zigzag to Baguio the trail is a comparatively easy one. During the season several mules met with accidents in climbing the zigzig, due to the precipitous nature of the trail.

PACK ANIMALS.

The pack train of 30 Chinese mules and 4 Chinese ponies made on an average of two trips a week, each animal packing about 150 pounds of freight. On completion of the packing season the animals were inspected and those fitted for use on the stage line were transferred to that division.

FREIGHT TRANSPORTED.

Total amount transported-----	pounds--	75,000
Total mileage covered-----	miles--	1,200

PERSONNEL.

	Per month.
One pack master-----	\$125.00
Three packers, American-----	75.00
Four packers, native-----	20.00

Your attention is respectfully invited to the present condition of the Benguet road, which is now completed, and the necessity of supporting a pack train is, in my opinion, unnecessary, and the early disbanding of same might be considered, as the mules could be used advantageously on the stage line, and others, with their packing equipment, could be placed where they are more needed than here.

EQUIPMENT.

The packing equipment is in excellent condition.

Very respectfully,

A. S. ASHE,

*Second Lieutenant, Assistant Supply Officer,
Philippines Constabulary, Assistant to Quartermaster.*

Capt. AUGUST C. A. HORTELS,

Quartermaster, Bureau of Constabulary, Manila, P. I.

OFFICE OF THE TRANSPORTATION OFFICER.

CONSTABULARY STAGE LINE,

Dagupan, Pangasinan, P. I., July 21, 1906.

SIR: I have the honor to submit below an itemized statement setting forth the number of pounds of freight transported through this office for the government bureaus for the fiscal year 1906, just ended:

Bureau.	Quantity.	Value.
	<i>Pounds.</i>	
Bureau of health	64,547	₱2,543.88
Bureau of education	21,397	766.21
Bureau of agriculture	151,528	6,061.12
Bureau of public works	16,583	663.32
Bureau of posts	42,940	976.40
Bureau of science	208	8.32
Bureau of lands	254	9.36
Executive bureau	7,176	287.04
Quartermaster supplies	251,181	7,764.30
Commissary supplies	242,729	8,683.92
Benguet Province	8,497	339.88
Nueva Vizcaya Province	8,051	160.99
Telegraph division, Philippine Constabulary	4,067	126.28
Total	819,138	28,391.02

In this connection attention is invited to the fact that supplies in small amounts were carried by the stages and escort wagons, charges being credited for same in stage line account.

The contract price for delivering freight from Dagupan to Baguio, per pound, was ₱0.04, and from Dagupan to Tayug ₱0.02.

All freight was hauled in carts by oxen or carabaos, usually taking from five to seven days to make the trip from Dagupan to Baguio and from four to six days from Dagupan to Tayug.

At such times as the Benguet road was closed for wagon traffic the pack train was put in operation, thus relieving the situation of freight blockade.

Very respectfully,

A. S. ASHE,

*Second Lieutenant, Assistant Supply Officer,
Philippines Constabulary Assistant to Quartermaster.*

The QUARTERMASTER,

Bureau of Constabulary, Manila, P. I.

OFFICE OF THE VETERINARIAN, BUREAU OF CONSTABULARY,

Dagupan, Pangasinan, P. I., July 2, 1906.

SIR: I have the honor to report that 95 per cent of the horses and mules at this corral used for transportation purposes on the Benguet road are in good condition; 5 per cent are practically unserviceable for the work required of them, due to laminitis and injuries of permanent nature.

I have treated in the last year about forty cases of suppurating lymphangitis, no deaths occurring from the disease. The largest per cent of the animals infected with suppurating lymphangitis have been stationed at the relays on the upper end of the Benguet road. The animals when found to have the disease are sent to the hospital at the station for observation and treatment. At no time during the last year has the hospital been entirely free of suppurating lymphangitis cases. A number of native horses, in use of the constabulary of

Pangasinan, as well as several Chinese mules, are quartered close to the hospital. None of these animals has contracted suppurating lymphangitis. This would indicate that if the disease is contagious or infectious it is very feebly so.

In the month of January a Chinese mule quartered at the relay station in Pozorrubio was discovered to have surra. Four other Chinese mules, quartered at the same corral, were subsequently infected, and destroyed. As soon as surra was discovered all exposed animals were quarantined, and blood smears frequently taken for microscopical examination. Special precautions were taken as to cleanliness and disinfection. No new cases have developed in the last three months; evidently the disease has been stamped out. It is thought that the animals referred to contracted surra from native horses at Pozorrubio, that were stabled not 50 yards from the relay corral in which the government animals were quartered.

When in Manila on special detail during the month of October a case of surra in an Australian horse and a case of glanders in a native horse was discovered. These animals were quartered at the Manila garrison and were destroyed immediately and the corral thoroughly disinfected, with the result that no new cases developed.

In the month of May a Chinese mule quartered in the relay corral at Twin Peaks was discovered to have glanders. The animal was destroyed immediately and everything that the animal had come in contact with was thoroughly disinfected, with the result that no new cases have developed.

The 6 or 7 native stallions in use of the constabulary of Pangasinan were castrated in the month of January. These animals were thin in flesh and aged. This makes 22 horses and mules castrated at this station, the animals varying in age, some of them probably 20 years old, with the result that they have all improved in flesh, become more tractable, and in every respect more satisfactory animals for work.

I have made a number of trips over the Benguet road during the year for the purpose of inspecting the animals at the various relay stations; also to note and improve the sanitary condition of the corrals. I have found them, as a rule, in as good condition as could be expected, taking into consideration that such corrals are in charge of native help, who are as a rule insufficiently experienced in such work. They have all been instructed as to isolation and disinfection and to report any animal showing symptoms of sickness to the proper authorities immediately. No further inattention to such instructions are expected.

I have recommended to the constabulary transportation officer, Benguet road, that another relay station be made, thereby making three relay stations instead of two between Dagupan and Baguio. The distance between Dagupan and Pozorrubio, the first relay station, is 18 miles. The distance is entirely too far to drive on a hot day, on a sweeping trot, pulling a heavy load. Such a station could be constructed out of bamboo and nipa at a very small cost.

Very respectfully,

DAVID G. KRETZER,
Veterinarian, Bureau of Constabulary.

The QUARTERMASTER,
Bureau of Constabulary, Manila, P. I.

(Through constabulary transportation officer, Dagupan, P. I.)

QUARTERMASTER'S SUPPLIES.

For the sake of quicker identification and accounting, property is grouped into ten classes as follows:

- Class No. 1, fuel.
- Class No. 2, forage.
- Class No. 3, stationery.
- Class No. 4, office and barrack furniture and fixtures.
- Class No. 5, means of transportation.
- Class No. 6, tools.
- Class No. 7, horse medicines, etc.
- Class No. 8, miscellaneous expenditures.
- Class No. 9, clothing and materials.
- Class No. 10, equipage.

Attention is invited to the following table, which gives a good idea as to the extent of the quartermaster's accountability:

Value of all property on hand on July 1, 1905.....	₱268, 601. 16
Value of property received from all sources during the fiscal year ended June 30, 1906.....	499, 263. 92
Total value.....	767, 865. 08
Value of all property transferred to provinces, sold, expended or destroyed during the fiscal year ended June 30, 1906.....	383, 112. 26
Value of property on hand June 30, 1906.....	384, 752. 82

In the value of property on hand on July 1, 1905, and on June 30, 1906, are naturally included all articles in use in the various Manila offices and store-rooms, etc.

The records show that 580 requisitions were received and acted upon during the fiscal year; that 450 purchase vouchers have been accomplished; that 157 transfers have been made by officers in the provinces to the quartermaster, and that the quartermaster has made 1,186 transfers to supply officers or other accountable officers in the provinces or Manila.

Class 9, clothing and materials, is the most important part of all the property, as upon it depends in a large measure the discipline and welfare of the enlisted men.

NOTE.—Tables showing clothing handled by the division accompany this report and are on file in the War Department.

Concluding this report I desire to express my appreciation of the able assistance rendered by Lieut. A. S. Ashe, transportation officer, Benguet road, and Lieut. John P. Doak, transportation officer, Manila, both of whom I commend to your consideration.

Very respectfully,

AUGUST C. A. BORTELS,
Quartermaster, Constabulary.

The CHIEF SUPPLY OFFICER,
Bureau of Constabulary, Manila, P. I.

EXHIBIT B.

REPORT OF THE DIRECTOR OF PUBLIC WORKS.

MANILA, P. I., August 17, 1906.

SIR: I have the honor to submit herewith the annual report of the operation of the bureau of public works for the fiscal year ending June 30, 1906.

In accordance with the provisions of the reorganization act, No. 1407, the bureau of engineering, created January 8, 1903, became the bureau of public works on November 1, 1905; and in addition included under its general supervision and control—

The division of building construction and repair, which was formerly the bureau of architecture and construction of public buildings.

The custodianship of all the vacant insular buildings and such others as were designated by the governor-general.

The Benguet road and the Benguet improvements.

On January 1, 1906, with the abolishment of the office of provincial supervisor, as provided under act No. 1401, the engineers heretofore designated as supervisors were transferred to the bureau. The provinces were organized into districts and engineers were assigned as district engineers; thus establishing in the bureau a division of provincial districts for the supervision of all provincial public works.

These changes have greatly increased the personnel and duties of the bureau, enlarged its field of service, and made it directly responsible for the proper control and execution of all public works coming under the provisions of the aforesaid acts.

As in previous years, the most important duty of the bureau has been the development and improvement of inland transportation, including the renewal and construction of necessary bridges. The insular assistance in the way of new appropriations has been comparatively small, and the main support has come from the revenues of the provinces and municipalities. The interest and activity of the local officials in responding generously in accordance with the means at their disposal have been highly commendable.

The total expenditure for the fiscal year for public improvements in the provinces was ₱855,040.42, a decrease from the preceding year of ₱208,847.33.

ROAD CONSTRUCTION.

Very little new insular work has been done, the following highways being mainly those upon which construction has been continued from the preceding year, and the general descriptions of these projects appear in the reports for 1904 and 1905.

Capas-O'Donnell-Iba road.—(See report, 1905, pp. 151 and 152.) Construction was commenced June 1, 1904, and completed March 31, 1906. For convenience in handling the work, the road was divided into five sections and mileposts were erected. The work accomplished during the fiscal year has been as follows:

Section I. Capas to O'Donnell, 10 miles. This section was well surfaced and permanent culverts and bridges were constructed the preceding year and only light maintenance work was required this year.

During the flood of July the 145-foot pile bridge over the Bangot River on the ninth mile was washed away. A new bridge was put in, 190 feet long, with argoso piles driven to solid foundation and superstructure of well-seasoned guijo, at a cost of ₱5,900.

Section II. From the tenth to the nineteenth mile follows up the broad valley of the O'Donnell River, through one of the richest agricultural districts in northern Luzon. This section did not require metaling, as the grade is of

material that packs well and forms a permanent roadbed. The approaches to two fords were paved, and the maintenance of the section cost approximately ₱13 per month per mile.

Section III. From the nineteenth to the twenty-sixth mile enters the Cordillera de Cabusilan and reaches the divide at an elevation of 1,700 feet in the twenty-fifth mile. This is the most expensive section of the road, consisting of many heavy side-hill cuts and embankments. The inside ditches were paved and 20 open-paved gutters were made across the roadway to carry the destructive flood water. Ten concrete culverts were constructed, one being 7 feet by 110 feet long under a 200-foot fill, 50 feet high. Six timber bridges with 3 concrete piers were constructed.

This district is inhabited by a tribe called "Bangas," similar to Negritos in life and habits, who carry on rude agriculture, but spend most of their time hunting and fishing.

Section IV. From the twenty-sixth to the fortieth mile. The road follows down the Bucan River, crossing it six times. At the thirty-sixth mile the valley broadens to a plain 5 miles wide and over 20 miles in length, containing many thousand hectares of good agricultural land with exceptional opportunities for irrigation. Some of the finest forest tracts along the road are found here. Seven concrete culverts and 3 wooden bridges were constructed, and about 1 mile of paved ditches and 43 rock drains. Maintenance on this section will be inexpensive, only light repairs being necessary at close of each rainy season.

Section V. From the fortieth mile to Iba, the fifty-fourth mile. Three miles of the first half of this section suffered considerably from the rainy season,, and was reggraded and resurfaced. Five bridges and 40 rock drains and 4,000 feet of paved ditches were constructed. Only light repairs were necessary from Batolon to Iba. Steel bridges over the Bacao and Bancol rivers on this section would be desirable, and would cost approximately ₱20,000 and ₱32,000, respectively, but they are not considered necessary at the present time.

The entire road is now being maintained, under the supervision of the district engineer, with a force of 54 natives, divided into section gangs with an American foreman, at an average expense of ₱800 per month.

Cost of construction.

Appropriation, act No. 1016, November 30, 1903.....	₱360,000.00
Salaries and wages, January, 1904, to May, 1906.....	220,103.92
Supplies, purchasing agent, January, 1904, to May, 1906.....	41,189.74
Subsistence, natives, January, 1904, to May, 1906.....	40,982.70
Subsistence, Americans, January, 1904, to May, 1906.....	14,354.79
Equipment and material purchased in open market.....	16,170.04
Transportation of supplies, etc., by special contract and railroad.....	16,822.98
Rent of buildings for offices, etc.....	514.17
Balance on hand.....	9,861.66
Total.....	360,000.00

Average number of Americans employed daily.....	10
Average number natives employed daily.....	400
Average salaries paid Americans daily.....	₱6.00
Average cost subsistence, Americans, daily.....	1.70
Average wages paid native laborers, daily.....	.50
Average wages paid native bosses, daily.....	1.00
Average cost subsistence, natives, daily.....	.12

Money statement.

Balance available June 30, 1905.....	₱85,933.20
Expenditures for fiscal year 1906.....	76,071.54
Balance available July 1, 1906.....	9,861.66

Cebu-Toledo road.—(See report, 1905, pp. 155 and 156.) Work was commenced on this project at both terminals, which are 24 miles apart and upon opposite coasts of the island, June 1, 1905, and for three months progressed favorably, but the difficulty of securing laborers made it necessary to discontinue work upon the Toledo coast in August. The laborers preferred to work irregularly in the cornfields at about 10 cents a day and could not be induced to work

regularly upon the road at 30 cents and rations. Work on the Cebu end was continued without interruption, the number of laborers varying from 400 to 1,200, with a daily average for the year of approximately 600, with 5 American foremen, under the supervision of the district engineer.

For 1½ miles from the beginning, at the intersection of the Cebu-Cacar road, the road is comparatively level and macadamized 16 feet wide. It then follows for 4 miles up the Mananga River with easy grades; but has heavy sidehill cuts and embankments with high dry-laid retaining walls involving very expensive construction. The heaviest grade is a stretch of 8 per cent in the sixth mile. The divide is at an elevation of 1,700 feet at the end of the ninth mile. The construction from here will be a well-graded 8-foot trail following down a large and very fertile valley to the Toledo coast.

Seven miles of permanent work, monumental in character, have been completed.

Money statement.

Appropriation, act No. 1329, April 18, 1905.....	₱178,000.00
Expenditures, 1905 (equipment).....	17,753.84
Balance June 30, 1905.....	160,246.16
Expenditures for fiscal year 1906.....	108,553.12
Balance available July 1, 1906.....	51,693.04

Wright-Taft road.—(See report, 1905, p. 156.) Seven miles (from Wright to Loquilocan) were completed at the beginning of the fiscal year. The road follows an old Spanish trail through a rich hemp district sparsely inhabited. A substantial 16-foot wagon road with permanent bridges was completed to this point. Thence for 4 miles down and following the Ulot River toward Balagon an 8-foot road has been constructed along the line of the original survey.

Additional surveys at the beginning of the year developed a route over a pass to the Mactaon sitio, and thence by way of the Molinao River to the east coast. Owing to the pulahan troubles in this district and to the south, it was deemed advisable to make Mactaon the objective point instead of Balagon. A divergence was made at the eleventh-mile point in the original survey, and 7 miles of broad, substantial trail for pack animals have been completed to the eighteenth-mile point. The remaining 5 miles to Mactaon are cleared and in progress of construction under the supervision of the district engineer, 150 natives and 2 American foremen being employed.

Owing to the scarcity of good labor and the inability to maintain a permanent working force, this work has been more expensive than estimated or anticipated. Few laborers remained more than six weeks at a time. The continuous training of new men, besides being discouraging to those in charge, operated greatly against the accomplishment of this work at the estimated cost. The tropical growth and heavy timber were very thick, requiring an unusual amount of sidehill clearing. Considerable rockwork was also necessary. The problem of subsistence for laborers required all provisions to be packed from the coast, and transportation was excessively costly and difficult to secure.

The necessity for military operation has been the first consideration in the construction of this trail, but it will provide for all the needs of the inhabitants for several years.

Money statement.

Appropriations:	
Act No. 1307, March 3, 1905.....	₱32,000.00
Act No. 1367, June 23, 1905.....	55,000.00
Act No. 1490, May 21, 1906.....	25,000.00
	112,000.00
Expenditures:	
Fiscal year 1905.....	₱20,828.23
Fiscal year 1906.....	74,853.57
	95,681.80
Balance available July 1, 1906.....	16,318.20

Bay-Tiaong road.—(See report, 1905, p. 152.) Work began on this road in 1904, and the section from Bay to San Pablo (9½ miles) was completed early in

the fiscal year. For 5 miles the road passes through very soggy soil, making the construction very expensive. Local transportation could not be secured and wagon transportation was contracted for from Manila. The road was metaled with gravel for its entire distance, and withstood the heaviest of traffic during the rainy season with a reasonable expenditure for maintenance. An organized maintenance force is kept on the road, consisting of 1 foreman, 12 laborers, 6 carabao, and 2 wagons, at an average cost of ₱250 per month. No serious breaks in the roadbed have developed, although an average of 60 carts and 800 pack ponies make daily trips over the road, and by actual count, recently made, in one day 132 wheeled vehicles and 1,497 pack ponies passed over the road from San Pablo to Bay, laden with produce. Before the construction of the road, the price paid for the transportation of copra from San Pablo to Bay averaged ₱1.35 per picul. At present the cost does not exceed ₱0.60 per picul. It is estimated that an average of 350 piculs of copra are transported daily from San Pablo to Bay, which, at a saving of ₱0.75 per picul, nets ₱262.50 per day or ₱80,325 per year.

In January, 1906, work was continued on the road from San Pablo to Tiaong, a distance of 8 miles. The soil in most places is extremely sandy—packs by traffic and forms a hard, smooth surface which wears well through the rainy season. A stretch of 1 mile through a rice paddy required heavy grading and surfacing. This was surfaced with gravel hauled over 3 miles, which, although of inferior quality, was the only material available and is making an excellent roadbed.

Three reenforced concrete slab-floor bridges, 14-foot spans, have been completed and the fourth is well under way. A number of small concrete culverts remain to be constructed and about 1½ miles of road to be graded and surfaced. This road passes through a thickly populated country and when completed should readily produce the same beneficial results to commerce as the Bay-San Pablo end.

Money statement.

Appropriation: Act No. 1073, March 3, 1904-----	₱144, 600. 00
Expenditures:	
Fiscal year 1904 -----	₱12, 495. 27
Fiscal year 1905 -----	94, 522. 39
Fiscal year 1906 -----	23, 744. 22
	<hr/>
	130, 761. 88
Balance available July 1, 1906-----	13, 838. 12

Calamba-Los Baños-Bay road.—(See report, 1905, pp. 152 and 153.) The first appropriation for this coastal road was made by the Philippine Commission in March, 1904.

The constructing quartermaster of Camp Eldridge was given the superintendency of this road until January, 1906, when the district engineer was placed in charge. The work was then so organized that the military authorities furnished the superintendency, corral equipment, transportation, and rock crusher. The wages of the teamsters, foremen, laborers, and the cost of material and operation of the crusher were paid from the appropriation.

The work accomplished during the fiscal year has been as follows: Beginning at the Calamba end, from the 1½-mile point to the 2¼-mile point, the road passes through a flat miry country, requiring extraordinarily heavy construction. An underpinning of local sandstone 10 inches deep was deposited by contract. Volcanic gravel was added and the body surfaced over with a light course of trap-rock screenings. Upon the next mile unscreened gravel 8 inches deep was deposited for a body and surfaced over with trap-rock screenings, which makes a substantial construction, the subgrade consisting of a volcanic layer of adobe.

The section from the 3¼-mile point to Los Baños, the 7½-mile point, formed a part of the first section of the road constructed prior to this year. The remaining 4½ miles from Los Baños to Bay pass through a fertile valley underlaid with clay. Telford construction was employed entirely upon this section with excellent results. The material was quarried and crushed at the Los Baños quarry at an average cost of ₱3.50 per cubic meter. Prior to January, 1906, the bridges were constructed of Oregon pine, since then only permanent structures have been erected, including one 14-foot span bridge and 4 culverts, with reenforced concrete floors and concrete abutments. The road will be entirely completed within two months.

Heretofore transportation has been practically prohibitive for at least six months of the year, which discouraged the acquisition of means of transportation. However, traffic is now being developed to an appreciable extent and in the course of a year or two will readily justify the construction of the road.

Money statement.

Appropriations:

Act No. 1074, March 3, 1904-----	₱34,000.00
Act No. 1378, August 2, 1905-----	24,000.00
Resolution, February 5, 1906-----	35,600.00

93,600.00

Expenditures:

Fiscal year 1904-----	₱2,686.90
Fiscal year 1905-----	26,258.86
Fiscal year 1906, July to December-----	29,258.86
Fiscal year 1906, January to June-----	28,751.01
	86,751.01

Balance available July 1, 1906----- 6,848.99

Magdalena-Santa Cruz road.—(See report, 1905, p. 152.) Previous to this year, 3½ miles of this road had been ditched and graded and 2¼ miles were surfaced with gravel, transportation being by contract at ₱12 per day for 4-line team and wagon, including driver. The gravel was obtained from the river at Pagsanjan and the haul was from 1½ to 5 miles. In a few months all of the live stock had died from disease, and the work was not begun again until January 1906. A contract was then entered into for traction transportation and the deposit of gravel at ₱7 per cubic meter, including all labor. Under these conditions the entire road was completed to Magdalena, a distance of 4½ miles, in June, 1906. No road roller being available the traffic was depended upon to bind the material. The road, at present, is in fair condition despite the fact that it rains daily, and traffic is increasing noticeably. The cost of transportation has been reduced fully one-half and this will undoubtedly be one of the most important roads in Laguna Province. Provision has been made by the province for maintenance with an organized force.

Money statement.

Appropriation: Act No. 1073, March 3, 1904----- ₱70,000.00

Expenditures:

Fiscal year 1905-----	₱15,217.95
Fiscal year 1906-----	54,208.50
	69,426.45

Balance available July 1, 1906----- 573.55

Tabaco-Ligao-Guinobatan-Jovellar road.—(See report 1905, pp. 154 and 155.) During the preceding year 8½ miles of the Tabaco-Ligao road were cleared and graded from the Tabaco end, and the remaining 9 miles of the road were completed September, 1905. Approximately 50,000 cubic yards of earth, 490 cubic yards of loose earth, and 460 cubic yards of solid rock were required where the road passes near the base of Mayon. One 4-foot concrete culvert, four 12-inch cement pipe drains, and one 45 foot timber bridge were constructed. During the first four months after its completion a number of barrios sprang up along the line. The old barrios have grown considerably, and a number of hemp warehouses have been built.

The appropriation for this road also provided for the construction of the Guinobatan-Jovellar road. Construction was begun September 1, 1905. Six miles of road from Ligao to Guinobatan being along the main highway of the province, did not require repair work chargeable to this fund. Of the 9 miles to Jovellar, 6 miles have been cleared, graded, and crowned, and one 25-foot timber bridge built. The grade consists of 47,000 cubic yards of earth and 830 cubic yards of solid rock. This road passes through a rugged and mountainous country, and although only three-fourths of it has been completed, it has already been of great assistance to the people in the marketing of their produce.

A request for an additional appropriation of ₱13,000 has been made but not allowed, as it is believed that the operation of the new road law will provide for

the completion of this road. Both of these roads traverse extensive areas of enormously rich hemp land from which the produce has heretofore been carried to market on the backs of men.

Prison labor was employed wholly upon these roads, the average daily working force being 396 prisoners. Ten American foremen and 8 native foremen were employed in the superintendence. To this appropriation is charged the cost of supervision, materials, medical attendance, shelter, and a portion of the clothing of prisoners, and subsistence. A guard was furnished by the military and the officer in charge allowed extra per diem compensation.

This experiment with prison labor has shown that such labor is more effective in work accomplished than was anticipated, the following showing the results which can be expected from such labor, per day of seven hours:

Breaking rock by hand, one-third cubic yard.

Mixing concrete (gangs, 25 men) 15 cubic yards.

Excavating earth, $3\frac{1}{2}$ cubic yards.

Excavating by hand and wheeling (100-foot haul), $2\frac{1}{2}$ cubic yards.

Timber bridges up to 60 feet in length (span), 10 carpenters, 5 linear feet per day.

The expense of housing and guarding, and the large number on the sick list, together with the expense of transportation to and from Manila, rendered this form of labor more expensive than hired labor at ₱0.50 per day; but in the province of Albay, where labor is more than ₱1 per day, and difficult to secure, the work was economically accomplished. A condition where prison labor would be most economical and could be handled safely and advantageously would be in the operation of a quarry, conveniently near the road to be constructed, and where crushed rock was to be used for surfacing. A rock-crusher plant could be inclosed in a stockade, including the quarters, kitchens, and other necessary buildings. A small guard would be required, and it is believed that 100 prisoners could operate such a plant and furnish material required for a section of 6 miles or more per year.

Money statement.

Total appropriation-----	₱90,000.00
Expenditures:	
Fiscal year 1905-----	₱50,402.82
Fiscal year 1906-----	32,135.96
	<hr/> a 82,538.78
Balance on hand July 1, 1906-----	7,461.22

Pagbilao-Antimonan road.—(See report, 1905, p. 153). This important road of 20 miles to the east coast was constructed during the two preceding years, but not completed in a permanent manner. The 4 miles of road through the mountain section was too narrow, especially at the turns, for safe wagon transportation; and the bridges and culverts of the lowland sections, being temporary structures, rapidly deteriorated and many failed. The severe baguio of September 26, 1905, caused heavy slides and overturned numerous large trees, obstructing the ditches and damaging the grades.

An appropriation of ₱60,000 was made in December, 1905, and the work on repairs and renewal of bridges was at once started. At the end of the fiscal year $5\frac{1}{2}$ miles of surfacing and $7\frac{1}{2}$ miles of regarding and crowning had been completed. Many culverts were replaced with concrete structures and some bridges of larger span were renewed with molave piles and yacal and supa superstructures. The concrete abutments for the Pasabahan and Binahaan bridges have been completed. Some difficulty has been experienced in securing sufficient labor and transportation.

Money statement.

Balance, July 1, 1905-----	₱773.61
Resolution, December 27, 1905-----	60,000.00
	<hr/> 60,773.61
Expenditures fiscal year 1906-----	21,966.28
	<hr/> 38,807.33
Balance available July 1, 1906-----	

a This does not include a bill of ₱12,139.89 for extra cost of subsistence and clothing claimed by Bilibid prison, now under discussion.

Lucena-Sariaya road.—(See report, 1905, p. 153). This new road, 6 miles in length, was completed at the close of the last year, except two important bridges, which will be ordered from the States, and it is believed that they can be erected within the balance of ₱14,322.29, remaining to the credit of the road.

The reconstruction and surfacing of 14.5 miles of the road from Sariaya, through Candelaria to Tiaong, was completed June 20, 1906, from the provincial road fund at an expense of ₱25,653.22. This completes an overland route with a first-class highway from the port of Bay, on Laguna de Bay, to Lucena, across the two provinces of Laguna and Tayabas.

Padre Juan Villaverde trail.—(See report, 1905, p. 151). This trail of 66 miles, from San Nicolas to Bayombang has a mountain section of 31 miles crossing the Cordillera Central, with the highest point at the divide at an elevation of 4,700 feet. This is the only route for traffic into the capital of Nueva Vizcaya from the west.

An insular appropriation of ₱3,000 was made in July, 1905, for the maintenance of this trail, and an organization of two permanent section gangs was formed. They not only successfully kept the trail open and in good condition, but renewed many of the timber culverts with masonry and cleared the right of way for several miles through the timber section to facilitate the drying of the trail during the rainy season.

The severe baguio of May 18 to 20, 1906, caused heavy slides in many places and necessitated 100 additional men for three weeks. This expense must be met by the province.

A request for ₱3,000 from insular funds has been made for the continuation of the maintenance the coming year.

Money statement.

Balance July 1, 1905	₱421.96
Resolution July 27, 1905	3,000.00
	3,421.96
Expenditures fiscal year 1906	3,421.96

Baguio-La Trinidad road, Benguet.—The government experimental agricultural station and the government stock farm in the valley of the Trinidad made it necessary to connect this valley with the terminus of the Benguet road at Baguio, a distance of 5 miles, in order to insure the transportation of supplies.

A survey and estimate was made and Gov. William S. Pack, of Benguet, superintended the work. Fifteen bridges of native timber were erected, and it was necessary to blast through a limestone ledge a distance of 1,100 feet. The entire work was done by native labor under the direction of an American foreman. The completed roadbed successfully withstood a rainfall of over 53 inches during May. A statement of expenses follows:

Appropriations:

Resolution February 1, 1906	₱2,500.00
Provincial government of Benguet	1,500.00
Township of Trinidad	1,150.00
Township of Baguio	1,000.00
	6,150.00
Expenditures: Cost of construction	4,739.75
Balance available July 1, 1906	1,410.25

BRIDGES.

The principal aim of the bureau along this line of work has been to develop the construction of permanent structures and to encourage the use of steel, concrete, and masonry. Only in exceptional cases, where it has been deemed economical and warranted by local conditions, has the bureau approved designs of temporary timber structures. This idea of permanency having been kept in mind by all our engineers, all culverts and the smaller bridge spans, from 14 to 30 feet, are now being renewed or constructed of concrete steel, in accordance with designs prepared by the bureau.

The bureau of supplies now keeps a stock of about three hundred 8-inch, 10-inch and 12-inch I-beams and channels in lengths from 15 to 31 feet, and the

delays and difficulties heretofore experienced in getting specified material are now obviated.

The following projects are the more important ones which have received supervision and assistance during the past year:

Bataan bridges.—An investigation concerning the project of rebuilding the bridges in the province of Bataan was made by this bureau at the request of the provincial board which urged the necessity of repairing certain bridges. The investigation made developed the fact that 10 large bridges were in bad condition and would require reconstruction at an estimated cost of ₱64,300, as well as 25 minor bridges whose repair was estimated to cost ₱31,700. The province had not the funds needed for this work, but offered ₱10,000 toward defraying the cost of the 10 bridges if the Commission would appropriate ₱54,300 from the proceeds of the improvement bonds authorized by act No. 1444. The Commission has not deemed it expedient to accede to the request of the provincial board.

A project looking to the repair of the government building and the jail was subsequently taken up by this bureau upon request of the provincial board.

The investigation developed that to properly repair the government building and jail would require about ₱10,000. This expenditure could not be undertaken by the province, and the Commission appropriated, by act No. 1410, as a loan to be repaid in two years, the sum of ₱6,000. With this sum, which was appropriated for the general expenses of the provincial government and for general repairs, the following absolutely necessary repairs were undertaken and have nearly all been completed:

For the construction of 3 stone arch culverts-----	₱2, 200
For repair of the Orion-Mabatan road-----	1, 000
For repair of the Samal-Dinalupijan road-----	1, 000
For repair of provincial building (temporary)-----	1, 000
For repair of jail (temporary)-----	500

Aparri bridge, Cagayan.—(See report, 1905, p. 157). The 100-foot span steel bridge at Aparri, Cagayan Province, which was let by contract to the Atlantic Gulf and Pacific Company on March 28, 1905, was satisfactorily completed by them, in accordance with the contract, on January 10, 1906. The contract as made covered only the steel span and four steel cylinder piers on which the bridge rests, but did not include the approaches. Endeavor was made to come to some agreement with the contractor to arrange for the building of the approaches. However, no reasonable price could be secured for this work from the Atlantic, Gulf and Pacific Company, and arrangements were made to have the approaches built by a local Chinese contractor. The work on the approaches progressed very slowly, but the bridge was finally completed and opened for traffic in March, 1906.

The contract price for the main span and piers was ₱10,800, and for the approaches, ₱2,000, making a total of ₱12,800, or a cost per foot of ₱128. This is high for a light highway structure such as was built, and it is hoped that the increase in this class of work will bring about more competition among contractors and reduce prices.

Bohol bridges.—The province of Bohol, on the basis of an estimate previously submitted by this bureau, has appropriated ₱20,000 to be expended in the construction of two steel bridges, one over the Moalong River, near the town of Loon; and the other over the Abatan River in the municipality of Cortes, about 7 miles from Tagbildran. It is proposed to build these bridges by contract and the project is being prepared for advertising.

The estimated cost of the Abatan River bridge was based on a span of 120 feet, which was stated to be the length required. Subsequent investigation, however, has developed the fact that the width of the river is 200 feet, and that two spans of about 100 feet each will be required, to be supported on two abutments and one central pier. This necessary change will make the cost of this bridge about twice the original estimate. It is likely, therefore, that the bids received will exceed the appropriation available by several thousand pesos.

Carlatan bridge, La Union Province.—A resolution of the provincial board of La Union, dated September 20, 1905, authorized the director of public works to sign contracts for furnishing materials for a bridge at Charlantan, not to exceed in cost ₱5,500. These materials were advertised for and the bid of the San Nicolas Iron Works, for ₱4,826.96, was accepted and the contract signed on behalf of the province October 6, 1905.

This is a 69-foot combination steel and timber highway bridge, designed by

the former provincial supervisor, and was successfully erected under the supervision of the bureau by the province. The work was completed in June, 1906.

Bacoor bridge, Cavite.—A steel bridge of 122 feet span over the Manalo River, in the province of Cavite, was advertised for construction by contract. The work involved the reconstruction of the abutments as well as the furnishing and erection of the superstructure. A bid from the Atlantic, Gulf and Pacific Company, of ₱9,107 was received. This bid is high; but not as high, in proportion to work required, as the bid received for the Minanga bridge, in Cagayan, which was advertised for at the same time. The bid was forwarded to the provincial board of Cavite and accepted by them. The bridge will be erected early this fall.

Cabuyao bridge, Laguna.—This bridge of concrete steel, with a span of 30 feet, was designed by the district engineer along lines laid down in the standard designs. It is an important bridge on the Calamba-Biñan road and is being built by contract at a cost, including masonry abutments, of ₱4,600.

Niuan bridge, Bulacan.—This bridge of concrete-steel, with a span of 20 feet, was built by the district engineer along lines laid down in standard designs.

The total cost of the bridge was ₱1,018.90, including the abutments, being a cost per foot of ₱50.95. A small amount should be added for the provincial teams and forage used in transportation, which was not included in the above. The results attained are very gratifying and speak well for this type of bridge. Several other similar bridges will be erected in this province as soon as funds are available.

Silonay bridge, Mindoro.—This is a trestle bridge, 330 feet long and 13 feet wide, built of dungon and guijo, across the Silonay River, Mindoro. It was erected by a Chinese contractor at a cost of ₱2,000, with a five-year guarantee.

This bridge, and the one at Surigao furnish good examples of the temporary bridge construction approved by this bureau.

Surigao bridge, Surigao.—This is a trestle bridge of twelve 20-foot spans with a roadway 16 feet wide, designed by the municipality of Surigao. Monocono piles and yacl and molave superstructure will be used. The contract has been awarded to a local bidder for ₱3,400, including the construction of the approaches, and work will begin in July, 1906. A steel bridge formerly occupied this site, but the available funds do not permit of building a like structure at the present time.

Minanga bridge, Cagayan.—This bureau advertised, at the request of the province of Cagayan, for proposals for a steel bridge of 100-foot span over the Minanga Estero in the municipality of Amulung. The abutments for this bridge have been built by the province. Only one bid was received, that of the Atlantic, Gulf and Pacific Company, for ₱8,925. This bid was considered too high and was not accepted. It is hoped to secure other bids upon re-advertising.

Hagonoy bridge, Bulacan.—(See report, 1905, pp. 157 and 158.) This work was undertaken by the municipality of Hagonoy, under the direction of the provincial supervisor, and the construction was discontinued for lack of funds after the bridge had been about three-fourths completed. The center pier was shortly afterwards found unsafe through failure of foundation piles, due to the action of the toredo and the scouring of the river bed. This pier, 18 feet high, consisting of concrete masonry encased in a 14-foot steel cylinder, later overturned, and, lying in the middle of the river, constituted a menace to navigation and tended to change the course of the river through the formation of a bar. A contract was entered into for the destruction of this pier by dynamite, and this was successfully accomplished for ₱200.

For the reason that the municipality of Hagonoy had sustained considerable financial loss on this construction, through no fault of its own, it was recommended that insular funds be appropriated for the construction of a new bridge at this point. The Commission, by resolution, decided that this action was inadvisable and by said resolution agreed to reimburse the municipality to the amount of ₱13,476.48 (the amount actually expended), less the amount of proceeds from sales of bridge materials remaining on the ground. Action along these lines is now being completed.

Height of bridges over Pasig River.—In connection with the general subject of bridges, considerable discussion has arisen during the last few months, concerning the required height of structures over the Pasig River, above the Ayala bridge. Both the Manila Electric Railway Company and the Manila and Dagupan Railway Company have requested permission to erect bridges over the Pasig River, above the Ayala bridge, in connection with their railway systems.

The Government dredge, operating above this bridge, requires a clearance of 40 feet, and it was recommended by the director of port works that new bridges to be erected be given this clearance. In view of the fact that the dredge is the sole reason for requiring such clearance, and also that the minimum clearance of bridges on the lower Pasig is 15.2 feet, the companies in question contended that a clearance of 40 feet was an unreasonable requirement. The Manila Electric Railway Company has agreed to construct a bridge with a clearance of 26.5 feet, and it is believed by this bureau that such height would be a fair and reasonable requirement. The dredge could be so altered as to pass under a bridge of this height, and it is proposed to have the companies pay a portion of the expense of such alteration.

The general question of the height of railway bridges over the Pasig River has been submitted to the supervising railway expert for his recommendation.

Bridge erection.—During the ensuing year it is desired to secure sufficient municipal and provincial appropriations on necessary projects, requiring the erection of large steel span bridges, that will warrant the employment of a permanent bridge gang of competent and experienced erectors. Orders can then be placed in the United States for bridges which can be delivered f. o. b. Manila, at a reasonable figure, and with this force of men, these bridges can be erected in the provinces more economically than under the present system of paying excessive prices to local contractors for this class of work on noncompetitive bids. At present there is not sufficient competition on advertised projects and usually only one bid is submitted, with excessive cost for field work and erection.

From the experience in Sorsogon Province, where five steel bridges were erected under the direction of the provincial supervisor in 1904 and 1905, it is believed that this plan will be economical and highly satisfactory.

MISCELLANEOUS SURVEYS AND CONSTRUCTION.

Mindoro road surveys.—By request of Governor Offley, of Mindoro, February 28, 1906, a survey party in charge of Mr. E. Thompson was sent to that island on March 10, to make surveys for roads from Calapan to Naujan, Pinamalayan to Pola, and Abra de Ilog to Mamburao, the surveys having been authorized.

The first survey, that from Calapan to Naujan, was completed on April 6, 1906. Much difficulty was encountered in securing sufficient labor to assist in the clearing of lines and other work. The near approach of the planting season increased this difficulty as the surveys progressed. The Pinamalayan-Pola survey was completed on May 30, and it was decided not to take up the survey from Abra de Ilog to Mamburao until after the planting season. The party returned to Manila on June 6, 1906. The detailed report of these surveys is now being prepared.

The work accomplished indicates that a road can be built at moderate cost between Calapan and Naujan. Between Pinamalayan and Pola, it is not recommended that a road be built, the cost being out of all proportion to the importance of these places, commercially or geographically.

Approximately 32 miles of line were run. Total cost of surveys, including office expenses, ₱2,106.

San Miguel de Mayumo-Sibul Springs road, Bulacan.—Under date of May 3, 1905, the provincial board of Bulacan forwarded a recommendation of the provincial governor asking for ₱15,000 for the repair of this road. A survey was authorized and on July 5, Mr. R. B. Tufts, assistant engineer, was detailed for this work.

Sibul Springs, on account of the medicinal qualities of its waters, is a favorite health resort of the Spanish and Filipino people of Manila, who go there to the number of several thousand each year. San Miguel being on the road, and only 42 miles from Manila, renders the trip a very inexpensive one. This distance from San Miguel to the Springs is only about 8 miles, over an old Spanish road which is in very bad repair.

The estimate of the reconstruction of this road and of macadamizing the same, and the erection of the necessary bridges was ₱40,710. This estimate has been revised by the district engineer, who states that with the assistance of the province of Bulacan and the municipality of San Miguel, an insular appropriation of ₱18,000, together with the ₱2,000 in the provincial road fund, will enable him to build a first-class road. A report has been forwarded to the Commission with the recommendation that the insular government make

this appropriation, provided the province of Bulacan and the municipality of San Miguel each furnish ₱1,000 toward the work. No action has yet been taken upon this project by the Commission.

The cost of the survey was ₱312.46.

Bohol roads.—Requests have been received from time to time from the province of Bohol for investigation of various provincial roads and bridges, and on July 6, 1905, Mr. R. F. Moss, assistant engineer, was directed to make investigation of the following projects:

- (a) Loon bridge.
- (b) Albuquerque bridge.
- (c) Abatan bridge
- (d) Causeway connecting Panglao with Bohol.
- (e) Road from Tubigon to Inabanga.

(a) and (c) are described in this report under Bridges, q. v. Connecting the island of Panglao with Bohol is a causeway consisting of a substantial fill of coral riprap built in 1872, which forms a first-class highway 25 feet wide and 2,950 feet long, with two bridges of 56 and 15-foot spans, respectively.

The municipal council of Tagbilaran, on December 31, 1904, requested the removal of this causeway, stating that it interfered with navigation and had seriously injured the fishing industry. As a result of a previous investigation by the provincial supervisor, and this later investigation by Mr. Moss, it was recommended that the subject be finally and definitely dropped, although it was suggested that when the province was financially able to bear the expense the installation of a drawbridge in place of the 56-foot bridge would be a desirable improvement.

The road from Tubigon to Inabanga is an extension of the coastal road from Tagbilaran to Tubigon. The old road was fairly well built, but all of the bridges are gone. The roadbed is still in fairly good condition, although overgrown in places. The road traverses fine farming land, thickly populated. The district engineer, Mr. T. W. Allen, estimated that 10 miles of road could be repaired at ₱1,300 per mile, and that the bridges would cost ₱9,000, making a total cost of ₱22,000.

On December 1, 1905, this bureau submitted to the provincial board of Bohol an estimate of ₱40,000 for projects (a), (c), and (e)—Albuquerque bridge having been constructed—and requested an estimate of the amount of money, material, and labor that could be furnished by the province and the interested municipalities.

The provincial board had previously appropriated the sum of ₱6,000 from the provincial road and bridge fund for a 92-foot span steel bridge at Loon. In addition, on January 22, 1906, the provincial board appropriated the sum of ₱14,000 for the Abatan and Moalong bridges. The erection of these bridges will be accomplished during the coming year.

The cost of these investigations and surveys was ₱1,551.02.

Wright-Taft road.—(See report under road construction; also report 1905, pp. 147 and 148.) A reconnaissance survey across Samar was made to Taft during the preceding fiscal year, by the way of the Ulot River. Further surveys and examination of the country were deemed advisable before determining the final location of the road through the interior. A survey party was sent, September 1, 1905, with Mr. R. A. Blair in charge. As a result of these investigations a route was located from about the 11-mile point, on the former survey to Taft, by way of the Malinao River. This river is somewhat parallel to the Ulot and empties into the ocean at Taft. For about 13 miles this location passes through a mountainous district and across two broad and fertile valleys, occupied at that time by active pulahanes. The remaining 12 miles is down the valley of the Malinao River, the last 9 miles of which is through settled and cultivated territory.

From about the 18-mile point of the main location a trail was located to Mactaon, about 5 miles. Construction to this point is completed and work is in progress upon the Mactaon trail. The party experienced great difficulty in securing laborers to clear lines through the tropical jungles and for the transportation of supplies. A great deal of malarial sickness prevailed among the party.

The estimated cost of the completed road to Taft is ₱138,000. The survey was completed in January, 1906, and the expense was ₱3,407.52.

Roads in Benguet and Lepanto-Bontoc.—The following surveys for wagon roads of 12-foot width, with maximum grade of 6 per cent, in Benguet Province, were made by Mr. George H. Guerdrum, assistant engineer.

From Baguio to La Trinidad, a distance of 4 miles (see under road construction); from Baguio to Bua, a distance of 5 miles; and the Baguio-San Fernando road to the Irian River, a distance of 6 miles. The total cost of these surveys was ₱472.55.

A survey was also made from Cervantes to Tagudin, Lepanto-Bontoc. The distance between these points is about 30 miles, and an old Spanish road, which can be used when the grades are improved, exists for about 10 miles of this distance. A survey was made of 10 miles of the remaining distance. Construction was commenced by the province of Lepanto-Bontoc on January 1, 1906. The cost of this survey was ₱240.

Interprovincial roads.—(See report, 1905, pp. 143 to 149). Action upon the following interprovincial projects, regarding which surveys, reports, and estimates were made during the preceding year and referred to the Commission with recommendations, has been postponed. It is believed that the adoption of the new road law will permit of the repair and construction of these roads with the assistance of provincial appropriations for the bridges.

	Miles.
San Fernando-Dinalupijan	21.5
Balanacan-Boac (Marinduque)	13
Valle Hermosa-La Castellana (Negros Occidental)	26.7
Iloilo-San José La Buenavista (Antique)	66
Tarlac-San Juan de Guimba (Nueva Ecija)	18
Cuyapo-Nampicuan (Tarlac)	43
Moncada-Nampicuan (Tarlac)	4
Magdalena-Luisiana (Laguna)	8
Majayjay-Lueban (Tayabas)	9

Benguet improvement surveys.—In October, 1905, three parties were placed in the field to expedite the location of the Baguio townsite and lay out the street system in accordance with the general plan outlined by Mr. Burnham. The detail plans were prepared under the direction of the consulting architect to the Commission. Mr. George H. Guerdrum was placed in charge of these surveys, and for the ensuing three months 12 Americans were employed in the work; then the force detailed was reduced to one party, which is continuing the work.

An accurate topographical map of the Baguio Reservation has been completed, four new triangulation stations have been established, and 1½ square miles additional mapped. The street and road system has been staked out, and the residence section subdivided.

Special surveys were made, in addition to the road surveys hereinbefore mentioned, as follows:

	Hec-tares.
New stock farm at Trinidad	17
Sanitarium reservation	4
Church reservation	36
Mount Mirador Observatory	33
Constabulary reservation	4.5

Since April the subdivision into building lots of the tracts established by the location of streets and boundaries has been conducted by the bureau of lands, and the sale of these lots, by auction, was effected May 28, 1906.

The expenses to June 30 for the Baguio town-site surveys was ₱15,739.35; and for the special surveys, ₱1,152.05.

Baguio water supply.—The report made in August, 1905, by Mr. H. F. Labelle, assistant engineer, covers quite fully the investigations made up the Agno River and elsewhere for a gravity water supply for Baguio, and proves the possibility of a plentiful supply of water for a large population at Baguio. For the present, however, there is sufficient water in the immediate vicinity of Baguio to supply a population of 10,000 or more inhabitants, which can be made available by installing a pumping plant and raising the water about 300 feet into one or more distributing reservoirs to be situated on heights around the town.

As yet no further investigations have been made beyond those covered in Mr. Labelle's report, but it is expected that additional data and information can be supplied in the near future.

Pampanga-Tarlac hydrographic surveys.—The work of collecting necessary hydraulic data in the provinces of Bulacan, Pampanga, Tarlac, and Nueva Ecija,

over the region affected by tidal streams and the overflow of the larger rivers, has been continued throughout the year.

Double lines of precise levels have been run and checked to 0.006 of a foot per mile, and permanent bench marks established from the barrio of Pugad to Hagonoy Church, and thence to Poambong, Malolos, and Calumpit, in Bulacan; to Apalit, Santo Tomas, San Fernando, Calulut, Angeles, Dau, and Mabalocat, in Pampagna; and to Bamban, Capas, Murcia, and San Miguel, in Tarlac.

The elevations were computed with reference to mean lower low water of Manila Bay, as shown by an automatic tide gauge installed at the mouth of the Pugad River, in Bulacan.

A topographical survey of the Hagonoy River was also made, for 4½ miles from Hagonoy toward the bay, with cross section of the river every 200 or 300 feet.

The cost of this work for the year has been ₱2,820.21.

Cebu burned area.—(See report 1905, p. 176.) The city of Cebu has suffered from three severe fires in recent years. The last, on March 11, 1905, practically destroyed the whole commercial center. As the old streets were narrow, very irregular, inadequate for the growth of the city, and the boundaries not well defined, it was decided to lay out the city anew. A committee, consisting of the director of public works, the governor, the district engineer, and the presidente, was appointed to make investigations and adjust all questions of the ownership of land, the widening of streets, and the location of new streets within the burned area.

Accurate surveys were at once made, and maps prepared of the burned district and adjacent areas. One map showed the original streets and property lines and another the proposed streets and property lines. Later, a map was prepared showing water-front land belonging to the insular government, which land it was proposed to request for use in making up shortages that would occur in private property as a result of widening old streets and making new streets.

By the provisions of act No. 1393, September 9, 1905, the aforesaid committee was empowered to acquire title to all lands within the area under consideration, by gift, cession, or transfer from the claimants of the said lands; and, having acquired title, was empowered to make application to the court of land registration to have the title to all lands within said area registered and confirmed in the name of said committee; thereafter to convey title to the person or persons or corporations entitled thereto in accordance with the plan filed with the application to the court of land registration.

The allotment of plats of land of equivalent value to the property owners whose land was utilized in part or entirely by the improvements made was a very difficult one to adjust; and to the energy and activity of the governor and the municipal council, as well as the public spirit shown by the citizens of Cebu, is due the credit for the success of this undertaking.

In order to facilitate the transfers, agreements to the proposed exchanges were drawn, and signatures of the various land claimants obtained as rapidly as possible. These agreements had not all been signed at the end of the fiscal year, but the work is progressing with as much expedition as seems possible under the circumstances.

The new scheme being inaugurated provides for straighter and wider streets and sidewalks, with uniform grade and sections, lots which all have a street frontage and which may be accurately described both as to dimensions and location. All the streets in the area under consideration have been monumented with concrete monuments.

Many of the property owners are so confident of the ultimate success of the undertaking that they have already constructed buildings on the new lots assigned to them.

The cost of this work to the bureau has been, since July 1, 1905, ₱1,098.77.

Santa Rosa Estero, Pasig, Rizal Province.—Through the improvement of the upper Pasig River by engineers of the Spanish Government, about the year 1888, there was reclaimed the bed of the Santa Rosa Estero, running through to the Mariquina River, together with a portion of the bed of the Pasig River. These reclaimed tracts are located in the municipality of Pasig.

The provincial board of Rizal Province, by resolution dated July 19, 1905, requested that the reclaimed area be conveyed to the province as a site for provincial buildings, park, and experimental farm. The attorney-general found the title to lie in the insular government, whereupon the Philippine Commission, by resolution dated January 5, 1906, authorized the governor-general to execute to the province the necessary grant.

A survey for plan and description of the grant was authorized and a field party, under Mr. Max Dobbins, assistant engineer, made the survey in February, 1906.

The irregular tract of 25 sides contains 4.5 hectares, and the location of the new provincial building has been determined, and the same will be erected this fall.

Tarlac and Nueva Ecija boundary survey.—This survey was executed in January by Mr. G. K. Larrison, in order to ascertain and fix a portion of the boundary between the provinces of Tarlac and Nueva Ecija, in the neighborhood of the barrio of Mebabon. No satisfactory evidence as to the true location of the boundary line was developed in this survey, and further work is still required.

Tayabas-Ambos Camarines boundary survey.—This survey was executed by the provincial supervisors and adopted by the provincial boards. The line begins at a point on the Sogod Bay, Pacific coast, thence follows southeasterly along the crest of the mountain range to Mount Labo, thence down the Pasay River to the Gulf of Ragay, in the China Sea, a total distance of 94 kilometers. This line was officially adopted by act No. 1468.

Nozaleda lumber yard.—By direction of the executive secretary, January 22, 1906, a survey was made in order to establish boundary lines and make a description of the lumber yard on Calle Nozaleda for future reference. This plat contains about 0.855 hectare, and 1,877 cubic yards of dirt are required to raise the level to that of the street. It remains as yet an unsettled question whether the property belongs to the civil government, the military, or to the city of Manila.

San Lazaro Hospital fill.—An investigation was made to ascertain the amount of filling required to level up and properly drain the grounds to the northeast of the entrance driveway at the San Lazaro Hospital. The placing of the necessary filling material, as a part of the contemplated improvement, was done by the division of building construction and repair.

Telephone building.—A survey and description of the piece of ground leased by the insular government to the Philippine Islands Telephone and Telegraph Company, comprising a lot of 3,750 square feet, was made by this bureau, under instructions of the secretary of commerce and police. A portion of this tract was occupied by the warehouse of the Fortin Building, which has been removed and a two-story reinforced concrete building has been erected on the tract.

Repairs to wharf, Mariveles, Bataan.—At the request, dated February 17, 1906, of the bureau of quarantine service, an investigation and report was made by Mr. Max Dobbins, assistant engineer, on the condition of the main wharf at the quarantine station, Mariveles. Repairs were found necessary and authorized; plans and specifications were drawn up and advertisements made for proposals. On May 10, 1906, a contract for completing the specified work was entered into with Mr. H. M. Loper, for the sum of ₱10,938.00. The repairs consist of furnishing and placing 33 luciu 60-foot piles, 18 North Carolina creosoted piles, 3,000 feet of 2½-inch planking, and other superstructure work amounting to 10,000 board feet of native lumber.

The superstructure of this wharf is of native woods, originally of six different classes, and a carefully kept record indicates that the average life of the most durable wood of the six used will not, under the attacks of the teredo, exceed eight years. The life of the superstructure will probably be ten or twelve years if it is not disturbed, but the constant repairs to the substructure will shorten this period several years. The entire main wharf, valued at ₱70,000, thus requires renewal about once in every eight years.

A realization of the importance of obtaining an economical and efficient means of protecting foundations against the action of the teredo, not only on the sea-coast but also in tidal streams, and the deduction from data at hand of the fact that but very few Philippine woods, and those mainly of small size and limited distribution, permanently resist the teredo lead to the conclusion that creosoting, applying a mechanical covering to native timber piles, or using a reinforced concrete steel pile afford the only solutions to the problem.

In order to make a comparative test of these various methods 18 creosoted North Carolina pine piles have been built into the Mariveles wharf during the repairs now in progress, and it is proposed to place near them, as soon as the funds become available, several piles with mechanical covering, and two or three concrete-steel piles now being designed.

Malacañan Palace River wall.—An investigation was made by Mr. A. G. Wheeler to ascertain the present condition of the wall and what repairs were needed, or whether rebuilding is required.

All of the river wall is standing at present. There is one bad bulge, beginning at a point 35 feet from the extreme up-river end and extending 100 feet down the river. The top of the wall has moved $1\frac{1}{2}$ feet out and is in imminent danger of falling into the river. The whole distance of the wall above the slip—382 feet—is in bad condition. The river water has dissolved the mortar between the stones and the whole wall has sunk and moved outward, except one short piece located about 100 feet from the slip. There is evidence of the existence of holes in the wall, shown by the sinking of the ground behind it. The wall below the slip is not in excellent condition, but as it is protected from the current there is no necessity for immediate attention.

The present structure projects into the river beyond the location of fair and reasonable harbor lines. A more advantageous location of the wall throughout its entire river front and a more substantial construction thereof will be necessary in the near future.

A concrete retaining wall on two rows of foundation piles is proposed. Four thousand five hundred pesos will be required to rebuild the 150 feet most necessary, and ₱10,000, it is estimated, will be sufficient for the entire work.

Post-office pier.—This pier projected beyond the approved harbor line in the rear of the Fortin Building and was used jointly by the bureau of posts and the civil commissary.

An investigation of needed repairs was made in February, 1906, and the pier was found to be in a very bad condition and rapidly going to pieces. After consultation with the director of posts, it was decided not to repair the old pier and head, but to remove it and to provide a floating head which would have the advantage of accommodating itself to the height of the launches discharging mail; the height of the old pierhead, at low tide, having been found to be very inconvenient.

The construction was authorized and a floating head was provided, made of a new scow 16 feet by 30 feet, which was anchored by means of iron straps to four new hard-wood piles, and a hinged gang plank was put in, to drop from the runway to the floating head. This work was done by contract, by the Atlantic, Gulf and Pacific Company, at a price of ₱1,980, and is giving excellent satisfaction.

Tarlac River control. (See report 1905, p. 160.)—Extensive surveys for the control of the Tarlac River were completed in 1905. A proposed dike was located beginning at the high ground above the village of Tarlac, and, approximately, following the road to Paniqui, a distance of 13.5 miles. Cross section and grade stakes were set and the earthwork calculated for a levee with an elevation of 3 feet above high-flood level and provision for a roadway along the top. The total estimated cost of these improvements was ₱400,000. The topography is such that this construction can be done in four sections, each of which will have its influence for protection and prevention of inundation.

The most pressing need for the control of the river is along the first section, from Tarlac to the junction of the Tarlac-Victoria road with the railroad grade. Great damage was done to Tarlac by the floods of 1904 and 1905, destroying streets, carrying away dwellings, and depositing sand over large tracts of cultivated land.

The local residents began, on their own account, to throw up a small dike, and a popular subscription was inaugurated in April, 1906, nearly ₱5,000 being subscribed. The province appropriated ₱3,000 and the municipality ₱1,000 in addition; and to these sums the Commission added ₱16,000 on May 1, 1906, in view of the interest shown by the provincial governor and the residents.

According to the original plans, this section of the construction was estimated at ₱100,000. It was, however, decided to modify the cross section of the earthwork, making it considerably narrower and without the roadway along the top, and to accomplish as much as possible with the funds available.

A reorganization was at once effected under the district engineer, with Mr. J. C. Koch, assistant engineer, in direct charge. An equipment for handling the work economically, consisting of steam roller, traction engine and wagons, tram line and cars, and two pile drivers, was placed in the field and work commenced May 10, 1906.

Eight hundred 30-foot piles were obtained by contract, and it was hoped that sufficient work would be accomplished before the rainy season to protect the town from a flood. However, the two unprecedented baguios of May 18 to 22 and May 27 to 31, respectively, did considerable damage and delayed the work. This rendered it advisable to abandon the earthwork until the dry season, confining attention to the completion of the reenforced concrete dam in the Cut-cut

River, the diverting jetty just above the Cut-cut, and the pile protection at the seven gaps along the east bank, where the river had broken across the road in previous years. At the end of the fiscal year 385 feet of jetty, consisting of two rows of piles with a brush and stone fill, had been completed; the Cut-cut dam with a 3-foot by 4-foot irrigation gate and tunnel about completed, and work is in progress upon closing the gaps in the roadway.

The expenses to July 1 have been ₱7,911.37. The above-mentioned floods washed away 12 cubic yards of concrete work, 20 yards of broken stone, and about 700 yards of fill, and did other damage, estimated at ₱700. The river rose 9 feet at the Cut-cut dam and had a velocity of 10 feet per second, which makes it the highest May flood known in thirteen years.

Pier at Puerto Princesa, Palawan. (See report, 1905, p. 162.)—The old pier was built when the port was a Spanish naval station. It was a pile-timber structure, 325 feet long and 12 feet wide, with a width of 50 feet at the head, and the depth of water alongside was 9 feet at low tide. From inspection made last year the pier was found to be in very bad condition and unsafe. A part of the wharf had fallen into the water, and the piles elsewhere were eaten away by the teredo.

Designs and estimates were made for both a steel and a timber structure, and it was finally recommended as the most serviceable and economical plan to extend the causeway approach 100 feet with stonework and construct a 200-foot timber pier of native hard woods, at an estimated cost of ₱10,000.

This construction was authorized by act No. 1479, April 23, 1906. Plans and specifications were prepared by this bureau, and the provincial governor was given direct charge of the construction. Work is progressing satisfactorily, and the services of prisoners are used advantageously in the rockwork.

HARBOR LINES COMMISSION.

The questions discussed at the various meetings of this Commission during the year, and the recommendations upon the same which have been approved by the secretary of commerce and police, are as follows:

A slight modification of the heretofore approved harbor line on the left-hand side of the Pasig, just below the Bridge of Spain. This accommodates more advantageously the location of the river wall being constructed by the city.

The establishment of harbor lines on the outer harbor, Manila Bay, regulating the length of wharves to 650 feet and fixing the length of 600 feet for the first wharf south of the entrance to the inner breakwater.

The location of harbor lines eastward from the Bridge of Spain to the Ayala bridge, and limiting the length of piers and other structures to these lines, and the location of lines for that portion of the river extending from the Ayala bridge to Calle Nagtahan.

The location of the harbor lines for that portion of the Pasig fronting the property of the Atlantic, Gulf and Pacific Company at the intersection of the Pasig and the San Juan rivers.

In addition, maps have been prepared showing the water front on the Cebu and Iloilo harbors and extending a few hundred feet beyond the present work of construction, with recommendations as to the most advantageous harbor lines, beyond which wharves, piers, and other structures should not extend.

IRRIGATION.

(See report, 1905, pp. 163 to 172.)

Extensive investigations and examinations were made during the preceding year upon various irrigation projects by Mr. Labelle and Mr. Dobbins, and provisions were made in the 1906 appropriation bill for the expenditure of ₱12,000 for repair and restoration of irrigation works on the "friar lands" estates, Cavite, this bureau to do the work and to be reimbursed by the bureau of lands. The work accomplished was under the direct supervision of Mr. Labelle, assistant engineer, and Mr. Westerhouse, district engineer.

Repairs to Cavite irrigation works.—All of the extensive repairs were made on the San Francisco de Malabon estate. Tunnels Nos. 1, 2, 3, 4, and 5, with a total length of 19,680 feet, and located between the Bancud and Buloc dams, had been silted up, due largely to the failure, at different intervals, of the stone arch revetment. In a number of cases the air shafts had caved in, destroying portions of the arches. All of the silt and caved-in material was removed and the destroyed arch sections temporarily lined with timber. In a number of

cases the old stone arch revetment is in a deteriorated condition, the keystones being loose and ready to fall out. In order to permanently repair the tunnels it will be necessary to put in concrete revetment at such points where defects have developed. At present the tunnels are carrying all the water available. However, its flow may be seriously interrupted at any time through a failure in the tunnel arch revetment.

On the dams of Bancud, Palaut, Buloc, Sabutan, Ladron, and Policena light repairs were made, placing them in a serviceable condition. As a rule these repairs comprised the clearing of underbrush and vegetation from the masonry, plastering over the dam head and exterior slope, and the reconstruction of destroyed masonry on the parapet walls. With the exception of the Palaut and Policena dams, all are in first-class condition. These two are undermining and must be repaired in course of time by the construction of aprons.

A large amount of work was done in reopening the main irrigation ditches. In places these had silted up to a depth of 6 feet, caused by general abandonment during the revolutionary period and the placing of obstructions in the ditches by irresponsible natives. These excavations covered a total canal distance of 13.7 miles, the most important of which is the main ditch from the Buloc dam, through Buenavista, to San Francisco de Malabon. The irrigation system as repaired is supplying the estate with its full quota of water. The repairs to date cover a total expenditure of ₱11,155.49.

Napo River project, Marinduque Island.—The provincial board of Tayabas requested an appropriation of ₱5,000 for furtherance of an irrigation project covering 2,500 acres on the Napo River in the municipality of Santa Cruz, island of Marinduque, and it was arranged that this bureau should investigate the project and the field expenses of the survey party be borne by the provincial board.

Mr. Max Dobbins, assistant engineer in charge of the field party, left Manila October 5, 1905, and returned December 27, 1905. The field expenses, which were paid by the provincial board of Tayabas, amounted to ₱471.75.

The watershed of the two branches of the Napo River, the proposed source of water supply, is 3,900 hectares in area, with a mean dry-season flow of 5 second-feet in each branch, or sufficient to irrigate 243 or 283 hectares, at a duty of 40.5 hectares per second-foot, without injury to the interests of persons using the streams for other purposes. The river is extremely torrential in character, the flood-level flow reaching 1,500 times the mean dry-season flow.

An inspection showed that, of the 1,012 hectares involved, the irrigation of 750 hectares was utterly impracticable because of the small supply of water, the broken nature of the country, and the tremendous expense of building the necessary canals. Estimates of cost were made for the irrigation (a) by gravity or (b) by pumping of the remaining 262 hectares, which have an elevation of from 20 to 80 feet above the fork of the river.

(a) The estimated cost of a gravity irrigation system, including dam, head-works, and main ditch, was ₱494 per hectare served, or from 5 to 10 times the expenditure permissible.

(b) The estimated cost of a plant for irrigating by pumping was ₱14,736.70, with an operating expense per wet-season crop of ₱3,235.68. These figures indicated, when compared with probable crop returns, that the success of the pumping project was doubtful under the most favorable conditions.

The Napo River irrigation project was therefore reported as not feasible.

Calamba hacienda, La Laguna.—The investigations of irrigation works on the Calamba hacienda, La Laguna Province, were completed August 15, 1905, at a cost of ₱3,366.52.

The field party, in charge of Mr. Max Dobbins, assistant engineer, made plats covering the topography and contouring of the irrigated land, details of dams, tunnels, and pipe crossings, and obtained data relative to flow of the streams.

The Calamba hacienda lies in the "tuff" area of central Luzon. From the Laguna de Bay to a line some three miles inland, the surface slopes off gently at about 25 feet to the mile, the depth of the soil over the "tuff" varying from 5 to 30 feet. This is the irrigable portion of the hacienda. Farther inland the country is, in the main, rolling; but contains many very low cones covered at the apex with only a few inches of soil.

The irrigable land is cut by the San Juan and San Cristobal rivers and, from an irrigation standpoint consists of three tracts—the San Juan tract of 266 hectares, which has to-day an ample supply of water; the upper San Cristobal tract of 206 hectares, the works on which may be placed in service at small

expense, and the lower San Cristobal tract of 496 hectares, works on which excepting the main ditches, have been destroyed by flood. The total irrigated area on the hacienda, including 18 hectares depending upon spring supply, is about 985 hectares. The San Juan area obtains an ample water supply from a dam and headworks on the river of the same name. The duty of the water is exceptionally low, being only 14 hectares to the second-foot. Both the dam and intake require immediate repair, estimated to cost ₱600, for which provision has been made in the current request for appropriation of the bureau of lands.

The upper San Cristobal area depends for water supply upon a dam, 128 feet in length by 40 feet in height, in the river of the same name, distant 6 miles from Calamba. The duty of the water here is also very low, being only 8 hectares per second-foot. The works include a tunnel about 1,500 feet in length and a pipe crossing by means of which the main ditch is taken under the river. Dam, tunnel, pipe crossing, and ditches can be placed in service at a cost of ₱2,000, provided there is demand for the land. None of the land is now under cultivation.

The original works for irrigation of the lower San Cristobal area involved 2 dams and a large dike, which have been destroyed by flood. The land is now partly planted to corn and produce, the remainder being given over to brush and cogon grass. It is reported to be feasible to irrigate this tract with water now wasted on the 2 tracts above mentioned, but the scheme is complicated by the claim of people of the neighboring town, Cabuyao, to rights in the flow from the upper San Cristobal main ditch. Plans and estimates of the cost of these projects will be made when there is prospect of the land being placed under cultivation.

Lolomboy estate, Bulacan Province.—At the request of the bureau of lands, and by authority of the secretary of commerce and police, dated December 21, 1905, Mr. H. B. Kirkpatrick, assistant engineer, was detailed to investigate the irrigation works and buildings on the Lolomboy, formerly a Dominican estate, near Bocaue, Bulacan Province.

The most important irrigation works on the estate are the Marilao dam, 22 feet in height by 290 feet in length, and the tunnel and aqueduct connected thereto. This dam will, it is believed, provide water for about 1,400 hectares, or nearly one-third of the area of the hacienda. Repairs, estimated to cost ₱1,000, are required by these works and will be made when funds are available. A survey of the irrigation works, estimated to cost ₱1,240, is recommended. The hacienda building requires general repairs, estimated to cost ₱4,460.

Santa Maria de Pandi estate, Bulacan Province.—At the same time and by the same authority above quoted, investigation was made of the irrigation works on the Santa Maria de Pandi estate, formerly the property of the Dominican order. The works consist of 11 dams of very small height but of unusual length, placed across catchment basins of an area of 100 hectares or less, each. The main object in the construction of these works seems to have been to divert the run-off to points where the rainfall alone was insufficient. There are no other works of importance.

A reconnaissance survey is recommended for the purpose of discovering a river which may be used as the source of a gravity supply.

Bubuisan River project, Laoag, Ilocos Norte.—The municipal council of Laoag, one of the largest towns in the islands, requested the detail of an engineer to investigate the problem of obtaining water supply for the wet-season rice crop in years when the rainfall was insufficient, and also for the raising of a desired dry-season crop on lands included within the limits of the municipality.

The report submitted by Mr. H. B. Kirkpatrick, assistant engineer, January 31, 1906, considers three different projects, all deriving a water supply from the Bubuisan River at a point 8 miles northeast of Laoag. The project, which is at once the most economical and in least conflict with existing water rights, comprises a concrete dam 260 feet in length, with one steel sheet piling wing.

The main ditch is to have a length of 14 miles and is designed for a flow of 25 second-feet or sufficient, considering the character of the soil, to irrigate 1,012 hectares planted to rice.

The estimated cost of the proposed works is ₱100,000 or ₱98.80 per hectare. This high cost, taken in connection with the fact that to divert 25-second-feet from the Bubuisan River in addition to the 41 second-feet now in use for similar purposes would exhaust the low-water flow of the river, is, it is believed, sufficient reason for an unfavorable report.

The cost of these investigations and surveys was ₱1,939.87.

Cadaclan River project, Dingras, Ilocos Norte.—The municipal council of

Dingras, Ilocos Norte, requested the services of an engineer in investigating the feasibility of a project for obtaining water from the Cadaclan River for the purpose of irrigating the Bacul plain. Instructions to comply with this request were given by the secretary of commerce and police on June 2, 1905.

The survey, with Mr. Kirkpatrick in charge, was started June 20, 1905, and completed August 9, at a cost of about ₱1,616.55.

The land to be supplied with water is a strip 7 miles in length and some 1,335 hectares in area, lying on the west side of the Cadaclan River. The principal crop is rice, with a large secondary crop of tobacco.

The works recommended are a brush and gravel dam with head gates, at a point 4 miles above the town, with a canal running thence to an old ditch now occupying the center of the tract to be irrigated. The capacity of this canal is to be 50 second-feet, or sufficient for 1,214 hectares of this particular soil when planted to rice, and for 2,630 hectares when planted to tobacco. The estimated cost of the permanent portion of the dam, with three-fourths of a mile of main ditch and small aqueduct, is ₱5,000, provided volunteer labor, as is probable, can be secured. The estimated annual cost of maintenance and attendance is ₱500.

The local authorities proposed to finance the project by means of special legislation, enabling the town of Dingras to invest municipal funds in the enterprise and to recover interest at 6 per cent, plus cost of superintendence and maintenance.

A final decision and recommendation is delayed in order to determine whether or not the benefit to cultivators, the great majority of whom are tenants, would be sufficient to warrant the expenditure. The advisability of special irrigation legislation, in view of the early consideration of general irrigation laws, is not recommended.

Laoag River project, San Nicolas, San Miguel, Laoag.—The inhabitants of San Nicolas, a barrio of Laoag, requested the investigation of the feasibility of irrigating a tract some 5,062 hectares in extent. This survey having been authorized by the secretary of commerce and police on May 23, there was combined with the area described, by request in resolution of the municipal council, dated November 18, 1905, 1,012 hectares in the adjacent pueblo of San Miguel. In the survey for the two projects cited there was developed an alternative scheme for the 1,012 hectares in the Bubuisan River project above mentioned.

Field work was prosecuted, under the same organization as the Bubuisan and Cadaclan River projects, intermittently from June 1, 1905, to December 7, at an approximate cost, including salaries, of ₱4,526.35.

A general study of the problem showed that the most advantageous solution would be the erection of a movable A-frame structure, closed by needles, in the Laoag River, above San Miguel. Plans and estimates were made for dam, head works, and ditches, together with provisions for river traffic, by means of a raft chute.

The head works comprise two intakes. The intake on the south side of the river is to supply the San Nicolas and San Miguel tracts with 100-second feet, through 26,500 linear feet of open ditch and 9,700 feet of brick culvert, while the intake on the north side of the river is designed to supply the Laoag lands with 25-second feet, through 19,400 feet of open ditch and two tunnels, respectively 3,300 and 3,900 feet in length.

The estimated cost is, for the San Nicolas-San Miguel system, including entire cost of dam, together with ferry to replace ford destroyed, ₱360,000; and for the Laoag ditch and tunnels, ₱160,000.

The San Nicolas-San Miguel system, to supply 6,072 hectares, has an estimated first cost of ₱59.30 per hectare, which, while comparatively high, is not prohibitive. The increased crop returns would readily bear the burden of maintenance, superintendence, sinking fund provision, and interest on bonds, provided that a method of financing the project can be had.

Further action in this matter is delayed by the impending irrigation legislation.

Proposed repair work.—An estimate of ₱25,000 has been made for the necessary repairs for the current year to the various irrigation systems upon the different friar-land estates. The larger portion of this work will be upon the Imus estate. This estate contains over 18,000 hectares, more than two-thirds of which is subject to irrigation. The existing system consists of 40 dams, from 45 to 900 feet in length, with many miles of tunnels and canals. Of these dams, 22 have been carefully examined, and many require extensive repairs

to their aprons, and some are undermined at their toes; one only, however, is in a critical condition with regard to safety.

All tunnels need cleaning out, and the silt and vegetable growth in the canals must be removed before the water can be delivered to the remoter sections of the irrigated areas.

In the building of these dams and canals, the Recoletos friars apparently gave first importance to the elevation of tunnels and canals, in order to reach more land, and the advantage of storage capacity was generally neglected. The bottom of the tunnels and canals which have their intake just above the dams are rarely more than four feet below the top of the corresponding dam. To save head, too little hydraulic slope has been given to the canals and, for want of proper velocity, they have become filled with the deposit of suspended matter carried in the stream; and this, together with the rank vegetable growth that develops rapidly, has choked these waterways so that they can not be used until the deposit has been removed. After they have once been cleared, proper maintenance by sections will make it an easy matter to maintain them open throughout the year.

IRRIGATION LEGISLATION.

It having been decided that the employment of the expert, recommended in the report for 1905, page 172, to study irrigation in these islands and to draft suitable legislation, was impracticable, this bureau, acting under instructions of the secretary of commerce and police, prepared a draft of the proposed law. All obtainable statutes, reports, and literature bearing on irrigation practices in various States and foreign countries were collected and a careful comparative study of them made, in connection with usages peculiar to these islands, the existing laws of water, and the irrigation code of the United States Reclamation Service. The resulting proposed law, now practically completed, embodies, it is believed, the best modern practice, while fully protecting existing rights.

The existing irrigation code for these islands consists, in the main, of a few articles of the Spanish laws of water of 1866, the applicability of which to the Philippines has been questioned. The code, in general, is vague; does not make proper provision for the necessary control of works, nor for the collection of data; it favors the large landowner as against the small holder, and as the demand for water increases with the growth of the country will be fruitful of that class of litigation which is regarded, in advanced irrigation practice, as unnecessary. The proposed act, while fully protecting appropriations under the laws of water, provides that, if not inconsistent with the terms of the treaty of Paris, the articles covering irrigation shall lapse.

The first six chapters, or groundwork, of the proposed act, have been compiled from the Canadian and Wyoming irrigation laws, of which Mr. Elwood Mead, irrigation expert of the Department of Agriculture, states: "The distinctive features are the absolute public ownership of streams; the care exercised in the preliminary steps for the acquirement of title; the fixing by the Government and not by the applicant of the amount of water to be acquired; the establishment of conditions before a dollar is invested by either ditch builder or water user, and, finally, the celerity and cheapness with which rights are established after the work is done, and the care and efficiency with which the Government protects those rights when once established."

The seventh chapter, on the operation of irrigation works, is the result of experience gained in these islands as to existing customs, combined with desirable measures from Wyoming and Javanese practice. The eighth chapter, on underground waters, has been compiled from the Kansas and South Dakota enactments; while the ninth chapter, on pumping plants, has been patterned on Egyptian laws.

The tenth and last chapter, when completed, will cover the financing of new irrigation works in the Philippine Islands, a matter which presents considerable difficulty. Bonds, if issued by the landowners of any section, would not find a market unless guaranteed by the Government, a step impracticable at present. The establishment of a reimbursable appropriation is likewise objectionable, principally because of the difficulty of making collections. It is possible that a solution of the question will be found in the issuance, by the landowners, of interest-bearing certificates of indebtedness, a portion of which, say one-half, will be taken up by the Government through a reimbursable appropriation, and the other half taken up by the landowners and by the laborers, the latter being thus paid for services rendered.

PUBLIC WATER SUPPLY AND ARTESIAN WELLS.

The interest shown by the municipalities in the improvement of the public water supply has steadily increased during the past year, and this question, of vital importance as a health measure, the solution of which has heretofore been held back by the want of funds and the unduly ambitious nature of the projects, seems to be in a fair way to solve itself. The well-boring outfit owned by the bureau has been in constant use during the year, and the steadily increasing number of applications for its use, together with the difficulties encountered because of the limited depth—700 feet—at which it will do good work, justify the purchase of a heavier rig as soon as funds are available. A large number of comparatively shallow drive wells have also been successfully sunk, mainly by private parties, and while wells of that class leave much to be desired, they are frequently a decided improvement, from a pathogenic standpoint, over previous conditions.

The tapping of springs, or of mountain streams on the numerous comparatively uninhabited watersheds is usually preferable to obtaining a supply from wells, and the abrupt transition from mountain to plain, which is characteristic of the Philippines, would seem to favor the inauguration of that class of projects. It is found, however, that the uniform distribution of the population in the lowlands, which, if we exclude Manila, places 90 per cent of the people of these islands in barrios of less than 3,000 inhabitants, and consequently renders available for water supply in any one locality only a small amount of funds, prevents the utilization of a spring or a mountain stream source by any except a few isolated pueblos. Gravity supplies, which depend either upon springs or mountain streams, are therefore generally impracticable in the Philippine Islands.

A modern direct or indirect pumping system, with distribution lines, and fire protection, will for many years be beyond the means of the average Philippine municipality. This is due, in part, to the small number of large towns, there being, according to the Philippine census, if we except Manila, only four of over 10,000 population. Of these four, two, Cebu and Nueva Caceres, have installed a well supply; and the third, Iloilo, possesses a partly completed well supply. From the experience with the question of water supply for Pagsanjan, La Laguna Province, an exceptionally prosperous municipality, it appears probable that an expenditure of ₱10 per capita to cover first cost of waterworks, and an annual charge of ₱1 per capita for interest and maintenance, would not be possible.

Neither a gravity supply nor a modern direct or indirect pumping system are therefore ordinarily feasible, and the solution of the question of public water supply will usually be found by tapping ground-water supplies by either deep or comparatively shallow wells. It is along these lines that the present development of public water supply is taking place.

Well at Cebu, Cebu.—Under date of February 4, 1905, the municipal presidente of Cebu advised that the municipality would defray the expense of sinking a well at that place, provided the same were successful, and shortly afterwards, Messrs. J. G. White & Co., contractors on works for improvement of the port, stated that fresh water for boiler purposes would be worth from ₱1,000 to ₱2,000 to them. The construction of the well having been authorized by the secretary of commerce and police, work was commenced on July 17, 1905.

Fresh water in gravel formation was found at 95 feet, but laboratory tests showed it to be unsuitable for drinking purposes.

Drilling was continued to a depth of 505 feet with no further results other than salt water. It was then decided that the prospects did not justify a further expenditure and the casing was withdrawn and the well abandoned. The total cost of the well was ₱5,216.80, or ₱10.33 per foot.

Well No. 2 at Cebu, Cebu.—It was decided to sink a second well, a short distance from the first, to tap the water-bearing strata above mentioned as lying 95 feet below the surface. The operation was successful January 17, 1906, and resulted in a flow of 20 gallons per minute at a depth of 30 feet. The total cost of the well was ₱1,228.81, or ₱12.94 per foot. Total depth, 95 feet.

Well at quarantine station, Cautit, island of Cebu.—At the request of the bureau of quarantine service, and by authority of the secretary of commerce and police, dated February 20, 1905, the boring of a well for the new quarantine station on Cautit Island, about 1 mile from the town of Cebu, was commenced January 27, 1906. On April 14, at a depth of 272 feet, a stratum was found which gave a flow of 15 gallons per minute at 1 foot above the ground level. The total cost of the well was ₱3,978.19, or ₱14.66 per foot.

San Fernando, Pampanga.—On July 25, 1905, the provisional board of Pampanga Province, by resolution, requested that a well be drilled at San Fernando and agreed to pay the actual cost of the completed well. The project was authorized August 8, 1905, and work commenced on May 23, 1906. On June 22, a flow of 125 gallons per minute was obtained by pumping from 7 feet below the surface, the depth of the well being 95 feet. The flow when not aided by pump was 35 gallons per minute. The total cost of the well was ₱1,566.88, or ₱16.49 per foot.

Macabebe, Pampanga.—Following some preliminary correspondence, the municipal council of Macabebe, Pampanga, by resolution dated June 14, 1906, authorized the construction of a well in that municipality and agreed to pay the actual cost of the same. The work is now under way.

Culion leper colony.—An indirect pumping system, with supplementary gravity supply, is under construction by the bureau of health, on Culion Island, for the supply of the colony.

Experimental driven well, Santa Ana, Manila.—For the purpose of obtaining data as to small and inexpensive driven wells, 1½-inch gas pipe, capped with strainer and joint, was driven by maul 25 feet into the ground at Santa Ana, Manila. A flow of 7 gallons per minute was obtained with hand pump. Comparative tests made at the government laboratories showed the water to be decidedly preferable to that taken from esteros and open wells. The well was sealed by the construction of a concrete curb and is now in constant use. The cost of the well was ₱126.45.

Experimental well, Dagupan, Pangasinan.—At the request of the district engineer, the water-jet boring rig owned by this bureau was loaned to Mr. C. M. Jenkins, for the purpose of driving an experimental well at Dagupan, Pangasinan. Several 2½-inch holes were sunk to depths varying from 15 to 130 feet with no result other than salt water. Expenses were paid by Mr. Jenkins.

Drive wells in Albay Province.—Private parties have put in small drive wells in Albay Province, as follows: At Legaspi, 4 wells; at Albay, 2; at Guinobatan, several; Ligao, 2; Tobaco, 1. These wells were from 16 to 60 feet in depth and in strata varying greatly in character.

Drive wells in Ambos Camarines Province.—Contractors have put in wells in Nueva Caceres, Bato, Nabua, Origa, Pili, and Magarao. About 60 wells have been driven throughout the province. No statistical information has been received to date regarding these wells.

NOTE.—List of wells requested to be drilled as rapidly as possible, the expenses of the same to be borne by the bureau, province, or municipality requesting the same, accompanying this report, is on file in the War Department.

PROVINCIAL WORK.

From July 1 until December 31, 1905, the provincial work was under the direct charge of the provincial supervisor, who was a member of the provincial board and paid from the funds of the province.

During this period there were 19 supervisorships, and 17 provinces in which the duties of the supervisor were consolidated with those of the treasurer, and 2 others in which the governors acted as supervisors. The province of Masbate was consolidated with Sorsogon, thus making a total of 38 provinces, of which the Moro Province is under the military and the provinces of Benguet, Lepanto-Bontoc, Nueva Viscaya, Mindoro, and Palawan are classed as non-Christian and receive special legislation.

On January 1, 1906, by act No. 1401, the office of supervisor was abolished and the powers, duties, and responsibilities, which were nontechnical and distinctly provincial, were transferred to the provincial treasurer. The provinces, with the exception of the non-Christian ones, were divided into 12 engineering districts and the district engineer assigned from the bureau "to have general supervision over the construction, maintenance, and repair of all provincial public works in the provinces and districts to which he is assigned which exceed in cost the sum of ₱500, and over all contracts connected with such works, under the regulations prepared by the director of public works." The district engineer was empowered to act in an advisory capacity to the municipalities, and, upon request of any municipal council, it is his duty to make investigations and surveys, submit reports and estimates, prepare plans and specifications, and if requested, be charged with the supervision of the construction of municipal and public works. The act further provides that the cost of authorized surveys and investigations, plans and specifications,

shall be a proper charge against the province or municipality requesting same, and that the actual cost of superintendency of construction, repair, and maintenance shall be charged against the proper appropriation for such work, not to exceed 10 per cent of the total cost.

NOTE.—The tabulation and map showing the districts, the engineers assigned, and their official headquarters, accompanying this report, are on file in the War Department.

Detailed instructions were given these engineers as to their duties in accordance with the provisions of act No. 1401, and they were directed to avail themselves of every opportunity to extend their acquaintanceship among the provincial and municipal officials and among the people generally, and to acquaint themselves with the financial resources of the provinces and municipalities of their respective districts, and to familiarize themselves with the condition of the existing roads and trails, and other public works, and to investigate the needs of the districts in regard to such work, and to make recommendations for the proper and economical prosecution of the work, and to energetically labor to develop local public spirit for the promotion of good transportation and for the commercial prosperity of the district. Considering the fact that only six months have elapsed, the results of the efforts of the district engineers are already apparent in the steady increase in the number and magnitude of the projects intrusted to them by the municipalities, and it is believed that, within a year or two, these offices will be self-sustaining.

During these six months, of the total amount of ₱420,685 expended in the provinces upon public works, ₱368,778 has been expended under the supervision of the district engineers.

NOTE.—Tabulations from the provincial reports showing expenditures and the work accomplished by the provinces in detail accompany this report and are on file in the War Department. The tabulation is given in two parts, the first six months being under the direction of the supervisors and the last six months under the direction of the district engineers.

EXPENDITURES FOR PROVINCIAL PUBLIC WORKS.^a

The total expenditure of ₱855,040.42 during the year shows a decrease from the preceding year of ₱208,847.33. This, however, is not a decrease to that amount in the actual expenditures from the provincial and municipal funds, but is due largely to the lesser amount of assistance rendered by insular appropriations as compared with the amounts available from such source during preceding years.

The items of construction show a considerable decrease in quantity, but this is due largely to the type of construction which has been greatly improved, as permanency in construction has been the aim. Quality, rather than quantity, of work has been the great economical consideration. The increase during the year of systematic maintenance of roads has been very creditable. Organizations for such maintenance in many of the provinces have been inaugurated in addition to those existing heretofore, the general method being to assign a capataz with from three to five men to a section of from 3 to 6 miles of road. This force is provided with suitable tools and taught the necessity of continuous repair work. More interest and attention is now being shown in this necessary work and the condition of the roads in general is greatly improved.

The roadmen themselves show decided improvement through experience, and where maintenance work is in operation its success is satisfactorily demonstrated to the authorities and to the people.

With the enactment of the Philippine road law act, July 13, 1906, a means has been provided, not only for securing proper maintenance, but also for sufficient labor to keep in good repair the existing main highways and bridges of the municipalities of the provinces. With the necessary and proper supervision as provided for in said act, the organization and efficiency of this labor will probably be adequate to meet the heavier repair and construction work necessary in the various municipalities, and the money accruing from paid taxes

^a The tabulation comparing the actual expenditures and work accomplished during the fiscal year 1906, with the two preceding years, accompanying this report, is on file in the War Department.

goes largely to purchase material for the renewal of the culverts and smaller bridges, leaving only the large projects, such as interprovincial roads, new roads, and steel bridges, to be appropriated for from the provincial road fund.

Every effort is being made in each province to encourage the adoption of this act by the assembly of the municipal presidentes and councilors which will be called in December for the purpose of voting on the application of the provisions of the act as a whole to their respective provinces.

DIVISION OF RAILWAYS.

Act No. 1507, enacted June 29, 1906, created the position of supervising railway expert, as of December 9, 1905, whose duties are:

"(a) To advise the secretary of commerce and police in regard to any concession or extension of concession if they be asked for by companies, firms, or individuals proposing to construct railroads in the Philippine Islands, whether the traction is by steam, electricity, or other motive power.

"(b) To supervise the construction and operation of all railroads being constructed or operated in the Philippine Islands, with a view to seeing that they comply with the terms of the concession from which they receive their privileges and with the laws of Congress and of the Philippine Islands governing such enterprises.

"(c) To supervise in particular the construction of railroads upon which interest of bonds is guaranteed under authority granted by the terms of the act of Congress approved February sixth, nineteen hundred and five."

Mr. F. A. Molitor was appointed to this position December 9, 1905, and upon his arrival in the islands in June, 1906, all duties pertaining to the division of railways of this bureau were transferred to his office.

Report of work prior to transfer of office.—The construction work upon the Cabanatuan and the Antipolo extensions of the Manila and Dagupan Railway Company's lines (see report 1905, p. 188), as authorized under acts Nos. 554 and 703, has been practically completed and these branches have been open to public traffic with the exception of the last 7 kilometers of the Antipolo extension.

Nine inspection trips were made in connection with rendering reports upon the satisfactory completion of different sections of construction prior to granting governmental authority for the opening of the same.

A great deal of data and information has been prepared in addition to maps for representatives who have visited the islands with a view of bidding upon the advertised proposals for specified railroad projects throughout the islands. Two trips for the examination of the proposed routes have been made, one being an extensive trip through the southern provinces of Luzon, thence up the east coast to Aparri and down the west coast to Manila, examining the harbor facilities.

The following is a statement of the traffic and business of the railroad and extensions now in operation and furnishes an interesting and instructive forecast of actual results to be obtained with the growth of other lines:

Statement of the traffic of the Manila and Dagupan Railway Company for the calendar year 1905. (Main line only.)

Total revenue.....	₱1, 694, 820. 01
Being an increase over 1904 of.....	218, 850. 02
Working expenses.....	723, 040. 02
Being an increase over 1904 of.....	62, 316. 63
Total passenger revenue.....	878, 524. 78
Revenue for passenger traffic per train kilometer.....	2. 21085
Passenger revenue per kilometer of road.....	5, 052. 74
Total freight revenue.....	615, 843. 63
Revenue per freight train kilometer.....	2. 81206
Freight earnings per kilometer of road.....	3, 549. 54
Miscellaneous receipts.....	130, 505. 60
Military transportation.....	69, 946. 00
Average amount received per passenger.....	6. 162
Average amount received per ton freight.....	2. 70424
Receipts per train per kilometer.....	2. 43737
Expense per train per kilometer.....	. 97339
Percentage of working expenses to gross receipts.....	42. 66

The total taxes paid for 1905 were 3.82 per cent of the gross receipts.

The equipment consists of 37 engines, 122 coaches (various), 709 freight cars and wagons (various).

The number of accidents during 1905 was 18 Class A (serious), 20 Class B (not serious), and 22 Class C (minor).

The revenue from traffic for the first half of 1906, from January 1, 1906, to June 30, 1906, over the main line and extensions, has been as follows:

Receipts.

Passengers	₱451, 649. 07
Express freight.....	42, 492. 79
Ordinary freight.....	359, 387. 58
Military transportation	51, 479. 31
Antipolo extension	67, 017. 36
Stotsenberg branch.....	17, 563. 90
Cabanatuan extension.....	153, 502. 03
Port line, to River Pasig.....	25, 556. 53
Total for six months.....	1, 168, 648. 57

Main line, Manila-Dagupan—(196 kilometers.) The improvements on the main line made during the fiscal year have been the relaying with 65-pound rail from Manila to Caloocan and double tracking, this is to be extended to Bigaa, 27 kilometers, and the improvement and increase of the trackage in the Manila yard.

Cabanatuan extension—(91.25 kilometers.) The first six sections to Gapan, 61.5 kilometers, were opened previous to July 1, 1905. The seventh section, Gapan to Peñaranda, 61.5 to 70.4 kilometers, was opened July 24, 1905, and the eighth and ninth sections, from Peñaranda to Cabanatuan, 91.25 kilometers, was opened December 18, 1905.

Four steel bridges, 10 timber trestles with pile bents, 4 concrete bridges, and 15 cement drains were constructed upon the last two sections.

Across the Río Chico, at Peñaranda, a pile bridge 1,755 feet long was constructed, which is to be replaced by twelve 100-foot steel spans. The incased concrete cylinder foundations and piers are nearly completed.

By the provisions of act No. 1453, enacted February 5, 1906, the company was granted the privilege of constructing a spur 620 meters long from the Santa Rosa station to the bank of the River Grande, and a cableway 300 meters long across the river, for the purpose of facilitating the handling of freight; also an extension of time from February 5, 1906, to December 31, 1906, for the completion of the Cabanatuan extension was granted February 5, 1906.

Antipolo extension—(40 kilometers.) The first section of this line was opened to public traffic from the Manila station to Pasig, 16 kilometers, on December 22, 1905. The second section, from Pasig to Rosario Junction and thence to Taytay, at 25 kilometers, was opened February 22, 1906, and the third section, from Rosario Junction up the left bank of the Mariquina River to Mariquina, a distance of 4.5 kilometers, was opened March 17, 1906.

On this line there are 5 steel bridges, 5 pile bridges, and 39 cement and masonry culverts. The San Juan River is crossed by a steel bridge of four 66-foot spans in concrete cylinder foundations, and the Mariquina River is crossed by a similarly constructed bridge but consisting of five 100-foot spans.

A ferry has been constructed between Fort McKinley station and the military wharf on the other side of the Pasig for the transportation of quartermaster wagons and military supplies. A request has been made for the construction of a rack railroad of the "strub system," not to exceed 2 kilometers in total length, on the last section of 7 kilometers to Antipolo. This type of construction was deemed the best method of securing ascent of the difficult hills in the climb to Antipolo. This matter is still pending.

On May 15, the company was granted an extension of time from May 23, 1906, until December 31, 1906, for the completion of the whole line.

The number of passengers carried on this line during the first half of 1906 was 258,612, or more than a third of the number carried upon the main line for the same period. The line is to be double tracked up to the Santa Mesa station and a spur line of 3 kilometers will be constructed to and across the Pasig River for connection with the proposed lines through the southern provinces.

Daet-Mercedes Tramway, Ambos Camarines.—The following report of the operation of the Daet-Mercedes Tramway, Ambos Camarines, was furnished by its manager:

The tramway runs from the docks at Mercedes to the town of Daet, a distance of nearly $4\frac{1}{2}$ miles. Passenger cars, pulled by Chinese trotting bulls, make the trip, Mercedes to Daet, and vice versa, in thirty to forty-five minutes. Freight cars, pulled by one bull, carry 25 bales of hemp down to the port, and 55 sacks of rice back up country. Average load, about 3 tons; time consumed in trip, one and one-half hours; freight capacity of road, 150 tons per day; number of passengers hauled during year ending July 31, 1906, 26,635; passenger fare, Mercedes to Daet, 20 cents constant, intermediate points in proportion.

Freight hauled during year ending July 30, 1906:

	Tons.
Hemp, 21,164 bales-----	3,543
Loose hemp-----	200
Rice, 46,448 sacks-----	2,852
Copra, 286 sacks-----	16
Boxes, etc., 11,298, all kinds, estimated-----	300
Vino, 4,600 demi-johns-----	57
Stone-----	177
Wood-----	172
Total-----	7,317

The average cost of hauling rice from Mercedes to Daet, during the years of 1901, 1902, 1903, and 1904, as shown by local shippers' books, was 30 cents; the average cost since the tramway went into operation is 15 cents; a reduction of 15 cents per sack. The average cost of hauling hemp, Daet to Mercedes, in 1901, 1902, 1903, and 1904, was $56\frac{1}{2}$ cents; since the tramway went into operation, 39 cents; a reduction of $17\frac{1}{2}$ cents per bale.

General results to province.

A saving to the hemp producers of $12\frac{1}{2}$ cents on 21,164 bales-----	₱4,550.26
A saving to the rice consumer of 15 cents on 46,448 sacks-----	6,976.20
With the carabao thrown out of transportation work by reason of the tramway and sent to the fields, a crop of 25,000 sacks of rice, the first since 1900, was raised in Northern Camarines, 25,000 sacks, at ₱5-----	125,000.00
Total-----	136,517.46

RAILWAY CONCESSIONS.

Act No. 1497, enacted May 28, 1906, granted authority to the Philippine Railway Company to locate, construct, and operate, under guaranty, the following railways:

"On the island of Panay: (a) A line from Iloilo, in the province of Iloilo and island of Panay, in a northerly direction, forking to the town of Capiz, and to a terminal on the Bay of Capiz and to the town of Bataan, on the north coast of the island of Panay, in the province of Capiz, a distance, approximately, of one hundred miles.

"On the island of Negros: (b) A line in the island of Negros, from the harbor of Escalante, on the northeast coast of said island, westerly, following the coast line to Himamailan, a distance, approximately, of one hundred miles.

"On the island of Cebu: (c) A line in the island of Cebu, running north from the city of Cebu to Danao, on the east coast, and south from Cebu to Argao, on the east coast, with the option to the grantee of a line across the island from Carcar to Sibonga on the west coast, and thence along the coast between Dumanjug and Barili, a distance, approximately, of ninety-five miles."

The company began the location surveys in June with five large and well-equipped survey parties.

The proposed act incorporated in the resolution of the Philippine Commission, dated June 26, 1906, grants authority to Messrs. Speyer & Co. to locate, con-

struct and operate, without guaranty, the following railways and extensions on the island of Luzon :

	Miles.
Manila-Cavite-Naic	29
San Fernando-Florida Blanca	14
Dau-San Pedro Magalang	9
San Miguel-La Paz	10
Panique-Tayug	28
Mariquina-Montalban	8
Manila-Batangas-Bauan	73
Calamba-Santa Cruz	22
Santo Tomas-Lucena	39
Lucena along coast	8
Pasacao-Legaspi	72
Pili-Lagonoy	31
Ligao-Tabaco	21
Dugapan-Camp No. 1	25
Dagupan-San Fernando	35
	<hr/> 424

Organization for the prosecution of the necessary surveys is being effected.

MISCELLANEOUS FRANCHISES.

Camiling-Paniqui Railway.—Act No. 1448, passed February 1, 1906, grants a concession to Mr. W. E. Olsen for the construction of a narrow-gauge railroad between Camiling and Paniqui, approximately 10 miles, the municipal boards of both towns having recommended that this franchise be granted. The railroad is to be 2½ feet gauge, with 12 feet clear roadway for its entire length. The gauge may be increased or diminished upon approval of the supervising railway expert. Plans were submitted by Mr. Olsen on March 1 and approved by this bureau March 5. April 4 Mr. Olsen accepted the terms of the franchise and certified that ₱2,000 had been deposited with the International Bank to the credit of the provincial treasurer of Tarlac.

Construction work has not yet begun upon the approved general plans.

Marine Railway, Opon, Cebu.—As a result of an inspection of the marine slipway at Opon, Mactan Island, Cebu, it was found to be sufficiently completed for safe operation. The length of the railway is 60 feet and of the cradle 30 feet. Provisional authority was granted Mr. Fernandez to open the smaller slipway to the public, December 1, 1905.

Very little work has been accomplished on the larger slipway. The original plans were for a railroad 400 feet long, with a cradle of 120 feet; these plans have been enlarged and it is proposed to make the railway 480 feet long and the cradle 150 feet. The capacity of this slipway will be a vessel of 300 tons.

On December 16 Mr. Fernandez requested an extension of one year for the completion of the larger marine railway. In accordance with the provisions of act No. 1256, this railway should have been completed May 1, 1906. On February 14, 1906, the Commission passed a resolution granting the request.

On May 10, 1905, Bonifacio Villanueva requested a concession for the use of the waters of the Trapichi River at Mauban, Tayabas Province. He stated that he was already using the water from this river and wished to establish a legal right thereto, and also requested permission to enlarge his plant. Upon examination made November 18 it was found that the project was not detrimental to adjacent property owners and did not interfere with the water supply, and it was recommended that the request be granted. The municipal council of Mauban stated that the project was in no way detrimental to the municipality and the provincial board on December 28, 1905, passed a resolution recommending that permission be granted.

Act No. 1456, February 20, 1906, granted this concession, and permission to operate the plant was issued on April 6, 1906.

Wharf, Nueva Caceres, Ambos Camarines.—Gutierrez Hermanos, of Nueva Caceres, were granted permission to erect a wharf at Nueva Caceres, Ambos Camarines, under the condition that they prove their title to the land in ques-

tion. On June 20, 1906, they reported that the work had been completed, and inclosed a copy of their title to the land. An inspection of this wharf by the district engineer has been requested, and if the work is found satisfactory a recommendation that they be granted full authority for the operation of the wharf will be submitted.

Military wharf, Legaspi.—On October 17, 1905, the quartermaster at Legaspi requested authority for the use of land in the construction of a wharf at that port. The previously existing wharf had been destroyed by the September typhoon. The provincial supervisor recommended that the request be granted, and this request was concurred in by the director of public works. A resolution of the Commission dated December 26, 1905, granted this request under the condition that if the site was required for more important improvements by the insular government the wharf should be removed.

BENGUET ROAD.

By the provisions of act No. 1407 the Benguet road and Benguet improvements were placed under the charge and supervision of this bureau on November 1, 1906. Previously the road was under the direct charge of Major Kennon. On February 7, 1906, Governor Pack, of Benguet, was appointed superintendent of the road, relieving Mr. George Hayward.

This office has no specific account of the work accomplished during the first seven months, but in general it may be classified as heavy repairs and renewals. A number of culverts were renewed with permanent structures of stone and concrete. Considerable stone retaining wall was constructed at different points. Several large slides occurred and had to be removed and the roadbed repaired over a large portion of the distance from Twin Peaks to Baguio.

Since February marked attention has been given the upkeep of the road, the building of ditches along the hillside above the road, and the enlarging of the gutters for proper drainage, widening the road where practicable, securing material for maintenance through the rainy season, and building stone retaining walls and earth embankments. A great many culverts have been renewed and others constructed with stone and concrete, and several timber structures were rebuilt. The section known as the "Zigzag" required the greatest attention. During the severe storm of May, from the 17th to the 31st, over 49 inches of water fell, and a force of 400, working day and night, were necessary to keep the road open. The organization for the maintenance of this road has been reduced to 2 Americans and 180 orientals, with 17 bullocks and carts for transportation.

The following is a tabulation of the culverts and bridges upon the road:

Box culverts	65
Stone or cement culverts	54
Pile bridges, 32 feet to 123 feet long	39
Stringer bridges	9
Truss bridges, 34 feet to 152 feet long	17
Suspension bridges, 136 feet to 295 feet long	8
Concrete arches, 32 feet to 50 feet long	5
Total	197

The bridges have been inspected and special attention given to the 8 suspension bridges. The examination showed that with the renewal of the head blocks and other specified parts with native hard wood the bridges would serve with their former safety another year. The expense of renewing these bridges with steel structures of the truss type is estimated at ₱120,000, and provision should be made for their renewal next year at the latest.

It is proposed the coming year to replace the 65 timber culverts with cement culverts and to replace the 11 half bridges over rock crevices with masonry walls or fills. There are many narrow places to be widened for the safety of transportation, and a quantity of dry rock walls, 2½ feet by 2½ feet, to be constructed on the outer side of the road along chasms. The adoption of a standard roadbed section for embankment excavation and sidehill work with ditches sufficiently large to carry the storm water is recommended, and the securing of good metal-ling for the road on the Baguio section is necessary.

The following is a statement of expenditures on the Benguet road for the fiscal year 1906:

Date.	Subject of expense.	Amount.	Total monthly.
July, 1905.....	Salaries and wages.....	P6,589.67	P11,201.33
	Transportation.....	70.00	
	Subsistence.....	29.76	
	Property.....	4,512.00	
August, 1905.....	Salaries and wages.....	6,543.14	20,057.50
	Transportation.....	87.45	
	Subsistence.....	7,656.55	
	Property.....	5,770.36	
September, 1905...	Salaries and wages.....	9,714.02	14,171.20
	Subsistence.....	1,474.22	
	Transportation.....	2,525.99	
	Property.....	456.97	
October, 1905.....	Salaries and wages.....	9,306.21	25,135.59
	Transportation.....	12,932.79	
	Subsistence.....	2,770.75	
	Property.....	125.84	
November, 1905....	Salaries and wages.....	9,632.16	20,093.05
	Transportation.....	10,123.95	
	Subsistence.....	236.94	
	Property.....	6.00	
December, 1905....	Salaries and wages.....	7,375.82	11,959.82
	Transportation.....	1,242.96	
	Subsistence.....	3,335.04	
	Property.....	6.00	
January, 1906.....	Salaries and wages.....	5,692.30	8,773.20
	Transportation.....	1,713.71	
	Subsistence.....	1,343.19	
	Property.....	24.00	
February, 1906....	Salaries and wages.....	2,143.30	3,049.07
	Transportation.....	391.07	
	Property.....	501.70	
	Miscellaneous.....	13.00	
March, 1906.....	Salaries and wages.....	2,784.32	3,069.22
	Transportation.....	266.90	
	Miscellaneous.....	18.00	
	Property.....	28.00	
April, 1906.....	Salaries and wages.....	2,726.37	2,874.82
	Transportation.....	110.95	
	Property.....	19.50	
	Miscellaneous.....	28.00	
May, 1906.....	Salaries and wages.....	2,626.77	3,590.26
	Transportation.....	969.49	
	Miscellaneous.....	4.00	
	Property.....	609.09	
June, 1906.....	Salaries and wages.....	3,516.92	4,904.18
	Subsistence.....	754.17	
	Property.....	24.00	
	Miscellaneous.....	24.00	
	Total.....		128,879.24

This statement does not include supplies purchased from the purchasing agent, as no record of same is to be found here.

Report of the division of building construction and repair.

[Formerly the bureau of architecture and construction of public buildings.]

The former bureau of architecture and construction of public buildings was made a division under the bureau of public works on November 1, 1905, and called the division of building construction and repair. As all the work that was being performed by the bureau of architecture and construction of public buildings was continued without any change by the division of building construction

and repair, no separate report will be rendered covering the two separate organizations.

On April 5, 1906, the entire architectural designing and drafting force of this division was detailed to the office of the consulting architect to the Commission, and since that date all plans for new buildings and for all alterations or repairs of sufficient importance to affect the appearance of public buildings, or which pertain to the architectural features of construction, have been prepared by his office.

The following is a general statement of the work performed by the division of building construction and repair and the former bureau of architecture and construction of public buildings during the year ending June 30, 1906:

BUREAU OF AGRICULTURE.

The removal of the stock farm from Baguio to the Little Trinidad Valley necessitated the erection of new buildings at the latter place. A barn with ample accommodations for the imported stock and a cottage for the superintendent of the farm were constructed of Benguet pine framing and galvanized iron roof. The old stable at Baguio was torn down and reerected at Little Trinidad. The cost of this work was paid from the funds of the bureau of agriculture, this bureau not having made provision for the same in its estimate.

The old tank and tower at the Singalong experiment station having been seriously damaged in the fire which destroyed the pump house at this place, a new tower and a large tank were erected. The cost of this work was also paid from the funds of the bureau of agriculture, for the reason as above stated.

AUDIENCIA BUILDING.

The toilet facilities for this building being entirely inadequate, the first and second story toilets were remodeled and additional toilet fixtures were installed. Minor repairs were made in the office of the clerk of the supreme court, consisting of a counter, etc., in order to keep the public out of the general office.

AYUNTAMIENTO BUILDING.

Coverings to protect the new tapestries in the marble hall from dust and light were made and installed. The old toilet room in the second story of the north wing was completely remodeled, new fixtures being installed throughout. This room was finished in white, the woodwork being painted with white enamel paint and the walls being of white glazed tile. Twenty-three canvas awnings have been installed on the various windows of the first and second stories. The shelving in the division of archives was moved away from the walls and set in carbolineum cups in order to stop the depredation of the "anay" which were rapidly ruining the records.

GOVERNMENT BUILDINGS, BAGUIO, BENGUET.

The work at this point has consisted chiefly of minor repairs to the existing buildings. No new work was accomplished other than that for the bureau of agriculture, mentioned elsewhere herein, and the pipe line from the spring to the school building at Bua, Benguet, for the bureau of education. The chief items of repairs consisted of fitting up one of the cottages for a hospital building when the sanitarium was leased, repairs to the office building, and new posts and sills in cottage No. 3.

A pipe line about 1,700 feet long, running from a spring on the hill to the Girls' Industrial School, at Bua, was installed. This gives an ample supply of water to the schoolhouse for all purposes and will also afford considerable protection in case of fire.

The engineering building, which has been authorized, has not been begun, the delay being due to the inability of the bureau to obtain lumber.

COLD-STORAGE AND ICE PLANT.

The cottage of the chief engineer of the bureau of cold storage, on Calle Carlos IV, has been raised and moved back off the street and the low place under the cottage has been filled in. The raising of the cottage was made

necessary by the fact that the surrounding ground had been filled in when the moat surrounding the walled city was filled, leaving the yard of this cottage below the new grade, making it a swamp and a breeding place for mosquitoes.

BUREAU OF HEALTH.

San Lazaro Hospital.—A range-closet and sink were installed in the insane ward. The balcony over a part of the building that was only one story high was inclosed for an airing place during the bad weather when the insane can not get out into the yard. The roofs and exterior of the contagious diseases hospital buildings were repainted.

The old crematory has been repaired and put in working order.

Civil Hospital.—The work at the Civil Hospital consisted chiefly of various minor repairs, no extensive alterations or changes having been made.

BUREAU OF CUSTOMS.

Semaphore station.—A cursory examination of the semaphore station developed the fact that the mast and superstructure were in a condition almost dangerous and the necessary repairs were made. It was found that the mast, instead of being guyed to the ground, as it should have been, was guyed to the beams of the superstructure; and, if repairs had not been made prior to the typhoon of September, 1905, it would undoubtedly have been blown down.

Main buildings.—The most important work at the custom-house proper was the installation of the hot-air pumping engine which was necessary because the city pressure at this point would not raise water to the tanks. The electric pump not having proven entirely satisfactory, owing to the fact that a competent mechanic could not be employed to take care of the same, and also that a new electric pump would have had to be installed when the new 220-volt current was turned on, a hot-air pumping engine was installed in place thereof. This has given entire satisfaction and the repairs thereto during the year have been inconsiderable. The cost of operation of this pump is much less than that of the electric pump.

Considerable shelving has been erected in the attic of the new building, which gives additional space for the storage of records. In order to utilize this space, and to lessen the heat, it was necessary to install roof ventilators, and if the number supplied is not sufficient, more will be installed during the coming year.

A new landing stage was installed at the quarantine detention station on Engineer Island. Media aguas were constructed over all windows on the second story river front.

Building at Iloilo.—A two-story concrete building, with galvanized-iron roof, is being constructed at Iloilo for office and storeroom of the surveyor of the port. The second story will be used for offices and the first story as a bodega. This building will cost, when completed, about ₱4,000.

Signal station, Corregidor Island.—The typhoon of last September caused slight damage to the signal station on Corregidor Island and this was repaired.

BUREAU OF EDUCATION.

The only work that has been performed for this bureau during the year, other than the remodeling of the mint building and the installation of the pipe line at the school at Bua, was the installation of a new pumping system at the normal school. The old system was in very bad shape, having been hurriedly installed when it was decided to use this building for quarters for the first contingent of American teachers, and it was intended for temporary use only. The baths were taken out and additional fixtures were installed, both up and down stairs, and the old cesspool was converted into a septic tank, with a drain running to the estero, a distance of about 500 feet.

Shelving was also installed in the storerooms in the mint building and in the American library.

FORTIN BUILDING.

The front rooms formerly occupied by the civil supply store, bureau of constabulary, in this building are being remodeled for a general office for the bureau of posts. A hard-wood floor is being laid and the window openings in the front are being enlarged to give more light. The stamp department will be changed from its present location to the room formerly occupied as a store-

room for the registry division, iron grillwork being installed and windows cut in the blank wall in front for light. A doorway will also be cut between the present office of the postmaster and the new general office of the bureau of posts.

INTENDENCIA BUILDING.

In order to provide accommodations on the Intendencia building for the coin which had previously been stored in the mint building, a new vault and a strong room of concrete were constructed in the former building. The ceilings of these rooms were designed with a view of making them strong enough to support that part of the building over them, so that in case of fire, should the upper walls fall in upon them, the vaults would remain intact.

The offices of the auditor and of the deputy auditor have been repainted. The auditor's call-bell system has been completely remodeled and an additional annunciator installed. Minor repairs were necessary in the offices formerly occupied by the bureau of lands in order to fit them for the use of the insular disbursing officer, when he moved into this building.

When the reinforced concrete ceiling over the strong room of the treasury was installed, the records of the treasury which were stored in the room immediately above had to be removed. A room on the first floor was fitted with shelves and a stairway installed to the second floor in order to give access to the room.

BUREAU OF INTERNAL REVENUE.

The old office of the city assessor and collector, which was used by the police department as a storeroom, has been converted into a very light and airy office room for the collections division of the bureau of internal revenue. Formerly this room was very dark, even for a storeroom; but by cutting large window openings in the walls it has been made very light. Hard-wood counters and wire cages were installed for the collectors and a new stairway cut in from this room to the second story. Two dumb waiters for carrying books and coin from the first to the second floor were installed. The old unsanitary toilet facilities were removed, and a modern sanitary system which affords ample accommodations for both the office force and the public was substituted in place thereof.

After this portion of the building had been remodeled, and the bureau of internal revenue had moved into its offices work was begun on the room just over the new collections division which had formerly been occupied by the police department as sleeping quarters. It was found that a large percentage of the floor beams, posts, and sills of this second story had been damaged by rot and "anay" to such an extent that the entire floor had to be removed, new flooring put in and the damaged joists replaced. When it was found that a new floor would be necessary, it was decided to make an experiment, and a hard-wood floor of tongued and grooved supa was laid. This has not proven entirely satisfactory, owing to the fact that the lumber was not thoroughly seasoned. It was stated that some of this lumber had been in the yards for three years, but as considerable shrinkage has occurred the truth of this statement may be regarded as doubtful.

The interior of this building was painted throughout.

A 12-station intercommunicating telephone system is being installed, which system, however, will have no connection with the new city central.

In this building, the old galvanized-iron transoms over the windows were removed and replaced with shell sash, and the large doors at both ends were converted into windows in order to give more light.

MINT BUILDING.

The Casa de Moneda, or mint building, was converted into a very comfortable office building for the bureau of education. This building was in a most dilapidated condition, unfit for use as offices, and was practically unoccupied. The old machinery was removed and the building entirely remodeled into what, as the director of education says, is "one of the best office buildings in the city." A new entrance was constructed on the Recoletos street side, which has been made the main entrance for the bureau of education. The old entrance on Calle Cabillo is used as the entrance to the American Library and to the store-rooms on the first floor occupied by the bureau of printing and the bureau of health.

The upper floor of this building affords sufficient space to enable the bureau of education to bring its various divisions under one roof, and also provides considerable space for storage purposes. An entirely new and modern sanitary system has been installed, also electrical installation for lights and fans.

BUREAU OF NAVIGATION.

The principal work for this bureau during the year was the replacing of the roof of the shops building which was blown off during the typhoon in September, 1905. Of that part of the roof which was blown off practically none of the iron could be recovered, as it was blown entirely off Engineer Island and into Manila Bay. So great was the force of the wind that when the iron went it took the purlins with it. New purlins were installed, and both iron and purlins were fastened to the rafters with iron straps, and it is thought that such an accident can not happen again without the entire roof structure going with the iron.

The little office occupied by the superintendent of interisland transportation, on the water front, was found to be entirely inadequate for his needs, and an addition was authorized. This addition consisted of building an extension in the rear, the full length of the building, and 12 feet wide. This adds two rooms to the old building. Modern plumbing fixtures were installed, there having been none heretofore.

BUREAU OF LANDS.

The buildings belonging to the San Lazaro estate, 17 Calle San Francisco and 157 Calle Victoria, Intramuros, having fallen into such a bad state of repair, the bureau of health ordered the same to be attended to at once. This bureau, on request of the bureau of lands, made the necessary repairs, the cost thereof being paid by the bureau of lands.

MALACAÑAN PALACE.

The repairs to Malacañan Palace during the year have been very general in character, and nothing of importance was done. Several temporary electrical installations were made for receptions, the cost of which was paid by the executive bureau.

ORIENTE BUILDING.

The dock in the rear of this building, used in unloading lighters, was completed. Other work in this building consisted of minor repairs.

BUREAU OF PUBLIC PRINTING.

The woodwork of the second story of this building had shrunk so much that it became necessary to calk the joints in order to prevent the rain from beating in. All the windows were repaired and put in good condition. Alterations were made in the stable in order to give accommodations for more horses, and a new wagon shed was built at the end of the same. Some settling in the power house caused the weight of the smokestacks to come on to the boilers, and before it was discovered one of the boiler fronts was found to have been cracked. It was necessary to install bracing and framework to take the weight of the stacks off the boilers. This work was done without causing the plant to be shut down.

SANTA POTENCIANA BUILDING.

Upon completion of the alterations in the mint building, the bureau of education vacated their quarters in the Santa Potenciana building, and the rooms so vacated were converted into offices for the bureau of public works, which was considerably enlarged by the reorganization bill. Quarters were also provided in this building for the consulting architect and the railway expert.

BUREAU OF SCIENCE.

Laboratory buildings, Calle Herran.—A new chemical storehouse, some distance from the main building, has been constructed. This was necessary as a precaution against fire. Fifty-one awnings were installed over the various windows of the building. An unloading platform to the coal bunkers, at the rear of the building was constructed, and the roadway from the power house to the road through the exposition grounds was completed.

ELECTRICAL WORK.

The electrical work has been very considerable, owing to the remodeling of all systems in order to permit of the use of the new 220-volt current on the old installations. The change, however, to the new system has proven very expensive to the government, not only in the cost of the necessary remodeling, but also because the new system is not as economical as the old 110-volt system. The electric current bills, in nearly every instance, have been increased 20 per cent since the new current was turned on. This is due partly to the fact that it appears to be impossible to get an electric lamp that will give the same light on the same number of watts at 220 volts as can be had for 110 volts. In addition to remodeling the systems, it has been necessary to keep a force of one American and two native electricians to make minor repairs at the various buildings, as required, both to electric-light and power systems and to call-bell and telephone systems. Such repairs keep these men busy at all times, and in cases where large pieces of work are to be performed, more men are taken on as required. Several temporary installations have been made at the Malacañan Palace for receptions, the wiring having been put up and taken down each time. This method has proven so expensive that it has been decided to make a permanent feeder installation upon which the temporary lights can be tapped as desired.

GENERAL.

At the request of the bureau of constabulary, this bureau has let contracts and undertaken the supervision of the building of barracks at Malolos, Catbalogan, and Zamboanga, the cost of these buildings to be paid from funds appropriated to the bureau of constabulary.

In addition to the foregoing repairs and alterations, the necessary minor repairs were made to all buildings from time to time, as required.

Considerable criticism of this bureau having been made because of the use, in its construction work, of so much American lumber, when native lumber is so plentiful, the following facts, in justification of its action, are submitted:

It has been impossible to get any quantity of good, seasoned native lumber in the Manila market. Those firms carrying any stock of native lumber let it stand in their yards, in the log, until they get an order; then it is sawed to sizes wanted. Allowing the logs to lie in the yard, even for two years, will not season them, but will cause them to check so badly that much of the lumber is wasted. An example of this is found in the supa floor in the internal-revenue building. When it was decided to install this kind of a floor, an order was placed with the bureau of supply for the amount required, 11,000 board feet, of first-class lumber, in both mill work and timber. The firm taking the order stated that they had on hand sufficient timber to fill the same, which timber they had had for three years. When this lumber was delivered, over 6,000 board feet were rejected on account of poor mill work and the inferior quality of the lumber. In order to prevent shrinkage, stuff 3 inches wide was ordered; but though the floor has been laid only two months, shrinkage of from one-eighth inch to one-fourth inch has been found, lateral shrinkage also having developed.

American lumber is cheaper, has the advantage of being well seasoned, and will stand the depredations of the anay (white ant) as well as any native wood of equal or of even twice the price.

Preference has always been given to native lumber when quality and price compared favorably, or was even as much as 20 per cent higher; but up to date no native lumber has been found which will meet requirements.

It is suggested that, if the mills and dealers in native lumber in Manila can not afford to carry a large enough stock of sawn lumber on hand which they can let season in their yards for a year, the government purchase a stock and carry it until it has been well seasoned.

In order that the bureau of supply may be able to fill all orders with seasoned lumber it should have a full year's supply on hand at all times. By this method the government would be able to get seasoned lumber whenever required. If this plan should be adopted, it is further suggested that the government lumber yard be situated near Bilibid prison, in order that the mill work could be done promptly and would not have to be done until the order was received. The expense to which this bureau has been put in the milling of unseasoned lumber has proven that it can not be surfaced satisfactorily. Bilibid prison has a large dry kiln which could also be used advantageously.

FINANCIAL STATEMENT.

The total amount of money expended under the direction of this division for the work herein mentioned, for minor repairs, and for outstanding obligations, for the fiscal year 1906 was ₱182,383.05.^a

DRAFTING.

Until April 5, 1906, when the drafting work of this division was transferred to the office of the consulting architect, 144 drawings were prepared.^b

Since April 5, 70 working drawings and 31 preliminary sketches have been made by the drafting section under the supervision of the consulting architect.

CUSTODY.

This bureau was charged, by act No. 1407, with the custody of all vacant buildings and such others as shall be assigned, from time to time, by the governor-general, also with the assignment of quarters to insular bureaus in such buildings. The Santa Potenciana, Intendencia, Oriente, and Fortin buildings were taken over on November 1, 1905, and the mint building on January 1, 1906.

Quarters to insular bureaus have been assigned in these buildings as follows:

Santa Potenciana.—Bureau of public works, supervising railway expert, consulting architect to the Commission, bureau of health.

Intendencia.—Bureau of audits, bureau of the treasury, bureau of coast and geodetic survey.

Oriente.—Bureau of constabulary, bureau of agriculture, bureau of lands, bureau of forestry, bureau of civil service; bureau of posts, telegraph division.

Fortin.—Bureau of posts, Manila post-office; bureau of supplies, commissary storehouse.

Mint.—Bureau of education, including ethnological division and American Library; bureau of printing, storeroom; bureau of health, storeroom.

The cost of maintenance of these buildings for the period of November 1 to June 30 is shown in the following statement:

Santa Potenciana	₱3, 803. 34
Intendencia	3, 845. 26
Oriente	8, 447. 03
Fortin	3, 608. 66
Mint	1, 796. 15
Total	21, 500. 44

A comparison of the cost of maintenance of the Fortin, Intendencia, Oriente, and Santa Potenciana buildings shows that during the fiscal year 1905 the cost of maintenance of these buildings was ₱41,275.49 and for the fiscal year 1906 ₱33,744.21, which includes the proportional part of the salary of the custodian properly chargeable against these buildings; which is a saving of ₱7,531.28 over the preceding fiscal year.

REORGANIZATION AND FINANCIAL STATEMENT.

The difficulty experienced the latter part of the preceding year in securing and retaining the services of technical men has been equally discouraging this past year, all the efforts of the civil service board to secure competent engineers requested for the vacant positions being unsuccessful. This is owing largely to the demand in the States for well-trained men and the attractions of the Panama Canal work. The demand in the islands for engineers has been constantly growing and is far in excess of the supply. With the recent promotion of railroad projects the contracting firms have offered inducements that have not been met in the government positions for the same class of service, resulting in the loss of a few good men.

Of the 42 technical positions provided for in this bureau, only 33 are filled, and of these only 18 are technically trained engineers, the others being detailed to

^a Detailed statement accompanying this report is on file in the War Department; also statement of balances of appropriations from July 1, 1905, to June 30, 1906.

^b List of most important drawings is on file in the War Department.

fill the higher positions from the lower grades. It is hoped that within a few months such inducements may be offered as will enable the bureau to secure sufficient engineers to successfully and efficiently handle the higher grade of engineering work which the bureau is endeavoring to attain throughout the islands.

The following tabulation shows the changes which have occurred in the personnel during the past year :

	Technical, Americans.	Nontechnical—		Total.
		Americans.	Filipinos.	
June 30, 1905	20	29	26	75
Permanent appointment.....	4	1	3	8
Temporary appointment.....	3	37	29	69
Resignations.....	7	23	6	36
Transfers from bureau.....	3	3	.....	6
Transfers to bureau.....	16	11	10	37
Removals.....	.....	2	2	4
June 30, 1906	33	50	60	143

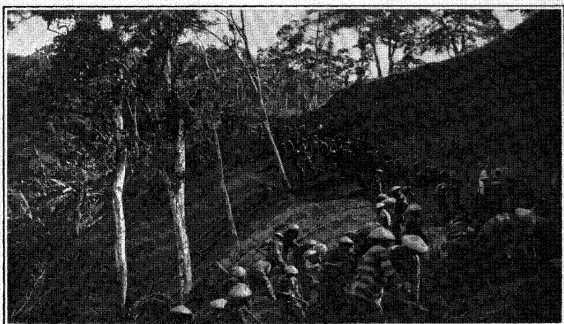
NOTE.—Financial statement, bureau public works, accompanying this report is on file in the War Department.

The bureau has not had the assistance during the entire year of many of its older employees, owing to resignation and to vacation leaves, which have been more numerous than in previous years. Mr. J. W. Beardsley, the director of the bureau, has been absent since April 18, and in addition the hydraulic engineer, the master-builder, and two district engineers are on vacation leave in the States.

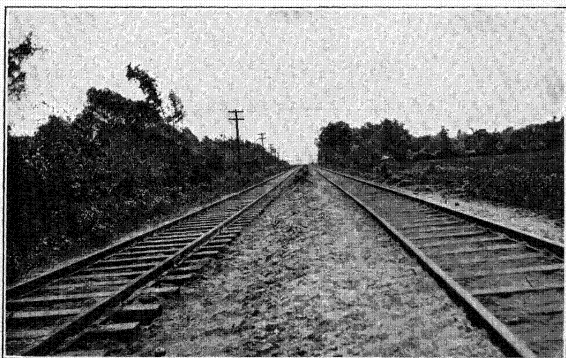
Respectfully submitted.

CHAS. H. KENDALL,
Acting Director of Public Works.

To the SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.



PRISONERS WORKING ON A ROAD CONSTRUCTION.



A RAILROAD DOUBLE TRACK.



EXHIBIT C.

REPORT OF THE CONSULTING ARCHITECT.

MANILA, P. I., August 20, 1906.

SIR: In accordance with your instructions, I have the honor to submit the following report for the office of the consulting architect for the period extending from November 17, 1905, the date of my arrival in Manila, to June 30, 1906.

The appointment of the consulting architect was authorized September 20, 1905, by resolution of the Commission, and the undersigned was appointed to the position on the same date.

The duties of the office of consulting architect are defined in section 2 of act No. 1495 of the Philippine Commission, enacted May 26, 1906, in the following terms:

"SEC. 2. It shall be the duty of the consulting architect to advise the governor-general, the Philippine Commission, the director of public works, and the municipal board of the city of Manila on all matters pertaining to the architectural features of construction, repair, or alteration of a material nature of public buildings and monuments of a permanent character, including the treatment of the city walls, approaches thereto, the moats and the area between said moats and the boundary streets of Intramuros, and to perform such other work as may be directed by the secretary of commerce and police. In case the consulting architect and the municipal board shall fail to agree on the treatment of the walls and moats and surrounding parks the question at issue shall be referred to the governor-general for final decision. He shall prepare plans, specifications, estimates, and other information for public buildings or works of a permanent character for the insular government, the director of public works, and the city of Manila, upon request: *Provided*, That when public competition for building plans shall be held he shall make such restrictions, subject to the approval of the governor-general, as he may deem advisable concerning the general type and style of building to conform to the development of the group of public buildings in the particular locality in question, which restrictions shall be duly set forth in the advertisement. He shall exercise general supervision over the architectural features of government constructions and of the landscape gardening of public places of recognized prominence. For the purpose of this act the word "government" shall be construed to mean insular, provincial, and municipal governments of the Philippine Islands. He shall be charged with the interpretation of the Burnham plans and the preparation of details where architectural effect or monumental features are involved."

In section 6 of this act, the relation of the consulting architect to the city of Manila is defined as follows:

"SEC. 6. It shall be the duty of the municipal board of the city of Manila, before expending any appropriation for the construction of buildings or architectural works of a permanent character or for repairs or alterations which materially affect the architectural appearance of buildings of a permanent character or of any construction involving a modification of the Burnham plans, including the laying out or alteration of public streets and parks, to request the written opinion and recommendation of the consulting architect."

The active work performed in this office dates from April 5, 1906, when, in accordance with the instructions of the secretary of commerce and police, the architectural drafting force in the bureau of public works, together with all architectural work, was transferred to this office. Previous to this time, the undersigned had been engaged upon the scheme for the development of Baguio

town site, the improvement of Zamboanga, and various problems which had been referred to this office.

The personnel of this office, at the present time, consists of the consulting architect, and one American and five Filipino draftsmen. The necessary stenography, typewriting, and clerical work have been provided by the bureau of public works; and problems involving surveys, the calculation of stresses, and similar work have received the attention of engineers of that bureau.

The cooperation of American and Filipino draftsmen in the drafting room forms an economical organization, and is successful in the routine work of preparing plans for buildings involving no great difficulties in the way of design or special construction. The need of additional American assistants, however, is felt in the larger and more important problems.

During the period of from April 5, 1906, to June 30, 1906, a period of nearly three months, complete plans and specifications for the following buildings were prepared:

- Trade school, Zamboanga.
- Industrial school, Vigan.
- Manila interisland transportation building.
- Office for surveyor of the port, Iloilo.
- Trade school, Bacolor.
- Provincial school, San Juan de Guimba.
- Constabulary quarters, Zamboanga.
- Engineering building, Baguio.
- Provincial building, Tuguegarao.
- Cottage, Singalong Experiment Station.
- School, Arayat.

- Provincial school shops, Tuguegarao.
- Provincial building, Albay.
- Constabulary officers' quarters, Malolos.
- Barrio school, Santa Ana, Pampanga.

Preliminary plans for the following buildings were submitted and are now under consideration:

- Manila general hospital.
- Proposed warehouses, Paseo de Magallanes, being a part of the plan for improving the docking facilities in Manila.
- Provincial building, Tarlac.
- Provincial building, Santa Cruz.
- Provincial building, San Fernando.
- Provincial building, Aliminos, Pangasinan.
- Provincial building, Pasig, Rizal.
- Market, Zamboanga.
- Market, Pasig.
- Addition to Audiencia Building.
- Constabulary headquarters and barracks, Albay.
- Jail, Malolos.

This office has also assisted the director of public works in determining what repairs and other improvements are desirable in buildings occupied by the insular government; especially in determining those mentioned in the annual appropriation bill.

City of Manila.—During this period the following problems were referred by the municipal board of the city of Manila to this office for recommendations:

(1) Sectional drawings of various streets, determining curb lines, sidewalk lines, position of arcades extending over the sidewalk and the projection of balconies and cornices.

(2) Proposed street system in North Tondo, a large tract including the Lerma and part of the San Lazaro estates.

(3) The location of the Malecon drive and the proposed boulevard to Cavite as far as the estero of San Antonio.

(4) The alteration of Cuartel Meisic for school purposes, by which accommodations for more than 1,700 pupils are being provided.

In reporting on the first of these questions provisions for the construction of arcades over sidewalks in certain business streets were recommended, for the convenience of wholesale and retail dealers and the general public, in protection against sun and rain. The importance of allowing, especially in residence streets, sufficient projection of balconies and cornices for protection against sun and rain is also emphasized.

The usual form of construction, with projecting second stories and wide cornices, is the result of long and close adaptation to climatic conditions in the Tropics, and the absence of these projections, with the protection which they afford from sun and rain, is felt not only by the occupants of the houses, but by persons in the streets. A special advantage of projecting the upper stories is the fact that in typhoons, the water, which invariably drives through the windows, is not communicated through the floor to the lower story, but drops on the outside.

The question of the location of the proposed boulevard along the shore to Cavite, to which reference has been made, will be considered with that of the new Luneta extension and the Malecon drive, and a general and detailed plan of the whole improvement will be submitted, with recommendations, at an early date.

Considered as a problem in general communication, the city of Manila is especially deficient in main thoroughfares for through and direct traffic. The collection of sixteen or more barrios, of which the city of Manila is composed, originally separate and distinct from each other, has now grown into a compact mass, while no consistent effort has been made to establish a satisfactory inter-barrio communication. This need is most apparent when one considers the difficulties attending the recent installation of the electric street-car system, involving many windings and turnings in narrow streets. The condition can only be satisfactorily met by the establishment of broad and direct boulevards. A much-felt want would be supplied by the extension of Calle Iris southward across the Pasig River and turning in a southwesterly direction into Pasay, thus forming a semicircle around the city and connecting such suburbs as Malate, Santa Ana, Pandacan, and San Sebastian. In most cases the formation of new boulevards may be accomplished by putting them through as new streets rather than by widening old streets where the reconstruction of buildings and other improvements are involved.

While the actual construction of such boulevards may necessarily be deferred to the future, their location should be considered at the present time, since they form the skeleton or framework of the street system. The locations of streets of secondary importance, which are frequently required for the development of properties in real estate, can not properly be determined before the locations of the boulevards have been fixed.

The comprehensive plan presented by Mr. Burnham provides admirably for general communication, but it is believed that his plan should be accepted as offering suggestions, rather than as showing exact locations, since in many cases a close study of the conditions on accurate maps shows that deviations from his plan are not only advisable but necessary. The street system of Manila should therefore be studied as a unit consisting of closely related parts rather than as detached details. In this work, this office will seek the cooperation of the office of the city engineer.

The first essential in civic improvement, well-maintained and well-cleaned streets, is being provided for, and the problem of sanitation will be solved with the construction of the new system of sewers. The first step in beautification is the removal of unsightly objects rather than the addition of adornments. The use of underground conduits for telephone wires and the combined use of poles for various electric wires has been a great step in advance, meaning the removal of many unsightly and awkwardly placed poles.

The grading and turfing of the filled-in moats around the Intramuros should be provided for in the near future. Plans for grading and draining this area and for affording additional entrances into the Intramuros are being prepared.

Baguio improvements.—Baguio was visited by the undersigned in December, 1905, and a plan prepared for the street system and subdivision of lots in the town site. A street system had already been laid out according to the first preliminary plan presented by Mr. D. H. Burnham; but since his second plan was considered superior to the first, the work of surveying was stopped and a revised plan was prepared, following the general lines of Mr. Burnham's second plan, but with modifications suggested by a close study of the topography and other conditions. The chief modification consists in the use of the flat, low ground for the town site as a meadow or park and restricting the part assigned for business purposes to the sloping ground in front of the tribunal, this portion being thought sufficiently large to accommodate business for many years. This section, together with about thirty-five lots on the hillsides, south of the center, for residence purposes, was laid out and surveyed during the following months.

A second visit to Baguio was made during part of the months of April and May, 1906, for the purpose of establishing a general system of roads and trails in Baguio and vicinity, connecting principal points with roads of gradients nowhere exceeding 5 per cent. These roads are being put through at present as trails or narrow wagon roads with the expectation of widening, straightening, and surfacing them, as funds become available. To make this possible, a strip 15 meters in width on each side of the road location has been reserved as part of the park system.

These roads and trails were located in such a way as to make accessible four different sections suitable for residences. These were subdivided, making in all 144 lots which were sold at public auction on May 28, 1906. Sites reserved for religious, social, and semipublic purposes were also sold at auction, an event which now makes possible the development of Baguio with private resources.

A condition at Baguio much to be regretted is the destruction, by fire, of the pine trees, both large and small. The young trees are, in some sections, completely burned out, and many of the finest old trees take fire at the trunks, near the roots, and, unless the fire is arrested, are burned through so that the trees fall, or are so weakened that they are blown over in the first wind storm. Although the provincial authorities have made every possible effort to prevent fires, the recent ones seem to have caused unusual damage.

It is recommended that, since prevention is impossible, the grass in the meadows and forests be burned systematically, at times when the wind is favorable, when enough men are on hand to prevent serious damage, and before the dry season is so far advanced that the fires can not be controlled. The newly constructed roads and trails, forming excellent barriers to fires, would make a systematic burning of the grass quite feasible.

The cutting and planting of trees at Baguio should be controlled by the principles of landscape art rather than those of forestry. Natural beauty of landscape may be enhanced by the formation of vistas and contrasts between thickly wooded hillsides and open glades. In general, it may be said that the development of Baguio and vicinity has become a problem of landscape gardening and architecture rather than one of engineering.

Zamboanga.—In the month of January, 1906, at the request of Major-General Wood, at that time governor of the Moro Province, the undersigned visited Zamboanga for the purpose of determining sites for a new custom-house and other public buildings, and to suggest general lines for improvements and the future development of the town. After studying the local conditions a general plan was prepared, providing sites for public buildings, a convenient system of streets, public parks, and extended facilities for docking, and for the development of commerce.

This general scheme, shown on a plan and described in a report, was approved by the legislative council of Moro Province and subsequently adopted.

Tarlac improvements.—The destruction by fire of the provincial building of Tarlac makes necessary the construction of a new building. In view of the fact that the former site is frequently inundated during the rainy season a new site has been selected on higher ground, about 1 kilometer distant. This ground, having an elevation of about 10 meters above the river and an area of more than 100 hectares, has been selected as the new town site of Tarlac. A topographical map is being prepared, and a street system will be established during the coming year.

General conditions of provincial work.—Attention is invited to the large and rapidly increasing number of buildings to be erected in the provinces, over which general supervision, according to act No. 1495, devolves upon the office of the consulting architect.

Cooperating with the bureau of education, this office has recently undertaken the preparation of plans for new school buildings throughout the archipelago. Up to the present time it has been the custom for the bureau of education to refer to this office letters received from division superintendents requesting plans for various kinds of school buildings. In some cases these letters were accompanied by sketches drawn by the division superintendents, or at their request, but seldom giving any information concerning the size, shape, or condition of the land on which it was proposed to build, or the relation of this land to streets or plazas, the cost of materials obtainable in that locality, or other conditions, a knowledge of which is necessary for logical and economical designing.

In view of the impossibility of making personal examination of these conditions, or even through a representative of this office, blank forms providing for

complete and specific information have been prepared and will be supplied to superintendents of schools and district engineers.

At present there is no written data concerning building methods, customs, or materials in the different parts of the islands; but it is expected that the information gradually acquired by means of these blank forms will prove to be a valuable addition to our knowledge of conditions for building and labor, and will greatly facilitate the preparation of plans.

It has been the custom to prepare special plans for each school building, a system causing many delays and much expense in drafting. It is intended that model plans for school buildings of various grades, sizes, and construction shall gradually be evolved, in order that the number of special plans, with consequent cost and delay, will be reduced as far as possible. In view, however, of the varied conditions throughout the islands, this process will naturally be a long and gradual one.

Another serious difficulty in building operations in the provinces is that of properly superintending the construction, seeing that it conforms to the plans and specifications, and authorizing payments in proper amounts and at the proper time. The cooperation of district engineers is therefore necessary, but is not, it is believed, in most cases sufficient, since their duties extend over large areas and their experience in special building construction is sometimes limited. In buildings for provincial governments and for sessions of the courts, where, to provide against loss of valuable records by fire, a construction of reinforced concrete is desirable, continuous and careful superintendence of the work is essential.

Prior to the American occupation, most of the architectural work, both designing and executing, was under the supervision of the Spanish friars; and the numerous monuments throughout the islands give evidence of their architectural knowledge and skill. Without their influence and control the result would inevitably tend toward incorrect planning, faulty construction, and irregular expenditures unless an effective system for controlling this work is established.

On the other hand, experience has shown that buildings of native construction may well be left to local authorities, avoiding the delays of correspondence, obtaining of data, and the preparation of drawings. For this reason it has already been recommended that barrio school buildings of native construction, costing not more than ₱5,000, and those of strong materials costing not more than ₱3,000 be left entirely to the division superintendents of schools for designing and execution. The distinction between buildings of light and strong materials was made for the reason that those of bamboo are temporary, while those of wood or stone are more permanent and require more technical knowledge and figured drawings.

Similarly, buildings coming under the direction of district engineers and costing not more than ₱10,000 may be left entirely to their judgment, they being familiar with local conditions and competent to provide plans for simple construction without delays. Upon request, however, this office should be prepared to furnish such plans or offer criticism of those submitted.

Building construction and materials.—In the construction of public buildings, the provisions for permanency should in most cases be insisted upon. Since the American occupation few buildings of a permanent character have been erected. The impatience to gain the greatest possible space for the least possible cost and the lack of definite plans for improvement have tended to lower rather than raise the standard of building construction. It is believed that temporary buildings are in the long run expensive, and should be resorted to only in case of immediate or temporary needs. The use of soft wood as structural parts of buildings of even minor importance is therefore condemned, being quickly attacked by any, subject to decay, and expensive to repair.

In recent years the demand for immediate deliveries of large quantities of lumber led to, first, the introduction of Oregon pine and, later, its general and excessive use, much to the discouragement of dealers in native lumbers. Aside from the fact of the superiority of native hard woods, even from an economical point of view, over imported woods, it is believed that building facilities in general in the islands will be improved by encouraging the production of native lumber, and insisting upon its proper seasoning and milling, rather than by the importation of foreign materials.

While the usual construction, consisting of hard native timber for the structural parts and soft timber for nonstructural, is suitable for such buildings as schoolhouses, markets, and barracks, a construction of masonry or reinforced concrete is urged for buildings containing government offices, where

valuable records are liable to destruction by fire. The chief difficulty in using reenforced concrete, however, is that its use requires much experience and constant supervision. Excellent, when properly mixed and applied, it is equally an unsound and dangerous material when carelessly or ignorantly handled. Its use should therefore not be undertaken in cases where there is not an assurance of intelligent and careful supervision.

The rapid disappearance of tile roofs is much to be regretted. Tiles are better adapted to resist heat than galvanized iron, and are themselves the crowning architectural beauty of buildings in tropical surroundings; whereas, a galvanized-iron roof, stiff and glaring, has the effect of cheapening and disfiguring. A tile of the Ludóvici type, which is held in place by wire, thus avoiding the excessive weight of cement, is not in danger of falling in earthquakes. The manufacture of roofing tile, formerly an important industry, may well be resumed and greatly improve the facilities for good building construction.

A higher standard of design and construction in public buildings is not only essential to the dignity and permanency of their purpose, but also as a means of education in setting before the people good examples of architectural planning and construction, in the hope that it may tend to elevate the standard in private constructions.

Respectfully submitted.

W. E. PARSONS,
Consulting Architect.

To the SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

EXHIBIT D.

REPORT OF THE DIRECTOR OF POSTS.

BUREAU OF POSTS OF THE PHILIPPINE ISLANDS,
OFFICE OF THE DIRECTOR OF POSTS,
Manila, P. I., August 21, 1906.

SIR: I have the honor to submit the following as the annual report of the bureau of posts for the fiscal year ending June 30, 1906:

PERSONNEL.

The transfer of the telegraph division of the bureau of constabulary to the bureau of posts January 1, 1906, caused an increase of 307 in the number of officers and employees of the bureau. The establishment of new post-offices made an increase of 61 postmasters during the year. There was an increase of 326 in the number of Filipinos employed, 9 in the office of the director of posts, 63 in postmasters, 32 in post-office clerks and employees, 37 operators, 182 linemen, and 3 letter carriers; while the increase in the number of American employees is but 67, 5 being in the office of the director of posts, 15 district inspectors, 23 operators, and 39 linemen, with a decrease of 3 American postmasters and 12 American clerks.

The following statement shows the number of officers and employees in the several branches of the service July 1, 1905, and June 30, 1906:

Office.	Employed July 1, 1905.			Employed June 30, 1906.		
	Ameri- cans.	Filipi- nos.	Total.	Ameri- cans.	Filipi- nos.	Total.
Office director posts.....	19	8	27	24	17	41
District inspectors.....	7	7	14	22	22	44
Postmasters.....	64	351	415	61	414	475
Post-office clerks and employees.....	55	74	129	43	106	149
Operators.....				23	37	60
Linemen.....				39	182	221
Letter carriers, Manila.....		15	15		18	18
Railroad post-office and steamboat clerks.....	10	10	20	10	10	20
Teamsters and drivers.....	1	6	7	1	6	7
Total.....	156	454	610	223	780	1,003
Mail contractors and carriers.....				7	305	312

During the year changes occurred in the personnel as follows:

	Ameri- cans.	Filipi- nos.
Reinstated.....		8
Transferred from other bureaus.....	85	196
Appointed from civil-service certifications.....	10	14
Appointed to unclassified positions.....	61	419
Temporary and substitute appointments.....	29	61
Transferred to United States postal service.....	2	
Transferred to other bureaus.....	5	4
Resignations:		
Classified positions.....	25	7
Unclassified positions.....	49	239
Removals:		
Classified.....	2	7
Unclassified.....	4	41
Deaths.....	2	6
Temporary and substitute employees discontinued.....	23	64

The large number of resignations from unclassified positions is caused by the fact that many of the postmasters at smaller offices, primarily employed in other branches of the government service, were transferred or relieved from such positions and by the appointing of telegraph operators as postmasters at 81 offices.

REVENUES AND EXPENDITURES.

The revenues of the bureau of posts were as follows:

	Fiscal year—	
	1905.	1906.
Stamp sales	P222,701.36	P427,796.72
Second class postage.....	5,023.48	6,273.82
Miscellaneous.....	417.79	91.84
Box rents	15,152.51	16,648.82
Money order fees.....	30,046.46	35,947.16
Total.....	273,341.60	486,758.36

The increase over the preceding year is P213,416.76, or over 78 per cent. Deducting from the total revenues only the amount of stamps used for telegrams sent from Signal Corps offices, the increase is P155,949.50, or over 70 per cent. Deducting the value of stamps used on all telegrams and the amount used for postage by the several branches of the civil government, the increase in revenues over the previous year is still P47,425.64, or more than 17 per cent.

The provisions of the reorganization act transferring the telegraph division of the bureau of constabulary to the bureau of posts, and imposing upon the latter bureau the duty of collecting and accounting for telegraph revenues of insular and military telegraph lines; also for the payment of postage on official mail of all branches of the insular, provincial, and municipal governments, both effective January 1, 1906, were the cause of an increase in postage stamp sales to the amount of P165,991.12, divided as follows:

Commercial telegrams sent from Signal Corps offices...	P41,430.28	
Commercial telegrams sent from insular offices.....	32,743.82	
Total commercial messages.....		P74,174.10
Civil government telegrams sent from Signal Corps offices	16,036.98	
Civil government telegrams sent from insular offices...	22,724.98	
Total civil government messages.....		38,761.96
Total amount stamps used for payment telegraph charges...		112,936.06
Postage paid by civil government.....		53,055.06
Total		165,991.12

Deducting this amount from the total stamp sales, there is yet an increase of P39,104.24, or more than 17½ per cent.

The increase in the amount of postage collected at the second class or pound rates is P1,250.34, or nearly 25 per cent. At the commencement of the fiscal year there were 38 publications and 5 news dealers authorized to mail their publications at the second, or 2-centavo per pound, rate of postage. During the year 24 additional publications were given this authority, while it was discontinued as to 10 publications and 1 news agent; so that at the close of the year 52 publications and 4 news agents had this privilege. This postage was collected from 17 different post-offices, the amount collected at Manila being P5,532.38.

The increase in the amount of box rents collected is P1,496.31, nearly 10 per cent. Post-office boxes for renting to the public are provided in but 8 post-offices. Such boxes are a source of revenue that can be materially increased. It is hoped that the appropriations for the current year will be sufficient to permit the purchase of cabinets for some 50 additional offices. Experience has shown that the box rents collected will pay for the cabinets in less than two years.

The expenses of the bureau were as follows:

	Fiscal year—	
	1905.	1906.
Salaries and wages	P439,161.33	P531,959.57
Mail transportation	123,681.07	129,974.17
Construction, maintenance, and repair telegraph and telephone line		100,706.04
Contingent expenses	73,745.05	75,398.22
Total	636,587.45	838,038.00

The increase in salaries and wages is caused by the addition of the telegraph division, January 1, 1906, and the establishment of 61 additional post-offices and by a large increase in the amount of the insular salary and expense fund payments.

There was a reduction of about P18,000 in the cost of clerk hire in post-offices, caused by the employment of more Filipinos in place of Americans as vacancies occurred and by combining the work of telegraph operators and post-office clerks.

The increase in inland mail transportation was caused by the extension of service to 61 additional offices, and by the employment of a mail launch in Manila Bay, at a cost of P30 per day.

There was an increase of P5,400 in the expense for rents of post and telegraph offices. The expense for this purpose is now about P15,000 per annum; this increase, as well as certain other expenses, being caused by provincial and municipal governments now charging rent and requiring payment for other services which were given free before they were required to pay postage on their official mail.

The total increase in expenses over the previous fiscal year was P201,450.55, or about 32 per cent, while the revenues, not including the telegraph business of the Signal Corps offices, as previously shown, increased over 70 per cent.

DEAD-LETTER OFFICE.

The work of the dead-letter office is concisely shown in the following statement:

	Registered articles.	Ordinary letters.	Ordinary packages.
Received from United States	394	4,446	402
Received from foreign countries	75	1,286	153
Received from Manila post-office	1,080	34,825	1,260
Received from other offices	20	48	46
Returned to dead-letter office after being sent out in attempt to find senders		3,813	
Total received	1,569	44,419	1,861
Returned to United States	260	8,532	433
Returned to foreign countries	606	2,490	529
Request matter returned to senders in Philippines	508	2,567	141
Opened and returned to senders		18,548	24
Containing money, drafts, stamps, etc., returned to senders		101	10
Containing other valuables returned to senders		86	230
Destroyed	19	12,003	321
Filed, containing money, drafts, stamps, etc		42	5
Filed, containing other valuables	176	50	168
Total	1,569	44,419	1,861

At the close of the year there were on file in the dead-letter office 344 registered letters and packages; 45 ordinary letters containing money, drafts, or stamps, and 472 letters and packages containing other valuables. During the year money to the amount of P71.17 was taken from letters which had been on file more than one year, and turned into the postal revenues.

These figures show a decrease of but 353 in the number of pieces handled, but this is encouraging, as during the fiscal year ending June 30, 1905, 8,959 more pieces of mail were handled than during the preceding year.

The large number of pieces of mail destroyed is caused by the fact that senders do not state their full name and address, either on the envelope or on the inclosure. If this information was always given, much undelivered mail would ultimately be returned to the senders which must now be destroyed.

During the year 42,574 pieces of mail were advertised, of which only 7,487 were subsequently delivered before being turned into the dead-letter office, or about 17½ per cent.

MONEY-ORDER BUSINESS.

At the commencement of the year the money-order service was in operation at 62 offices. During the year the service was discontinued at Corregidor, Cuyo, and Twin Peaks, on account of there being no longer necessity for its continuation. The service was established at Fort William McKinley during the month of April, so that at the close of the year the total money-order offices numbered 60.

The money-order business for the year was as follows:

Total number of orders issued 94,261, increase 11½ per cent.

Amount of orders issued \$3,687,126.81, increase 7 per cent.

Fees on orders issued \$16,401.44, increase 12½ per cent.

Number of orders paid and repaid 48,380, increase 10½ per cent.

Amount of orders paid and repaid \$1,923,203.20, increase 7½ per cent.

Average amount of each order issued \$39.10, last year \$45.80; average amount of each order paid \$39.95, last year \$40.

Deposits of money-order funds received at Manila from provincial offices \$1,720,735.57, increase 11 per cent.

Amount of money sent to provincial offices to pay orders \$29,353, increase 36 per cent.

Amount of invalid orders deposited with insular treasurer \$3,369.32, decrease 34 per cent.

Amount of Philippine orders paid in the United States \$2,166,718.66, an increase of 20 per cent.

Amount of United States orders paid in the Philippines \$157,303.03, an increase of 15 per cent.

The greater increase in the amount of fees collected than of the total amount of orders issued was doubtless caused by the law, effective May 15, increasing the fees from one-third to two and two-third times the old rates, on all orders over \$10 drawn payable outside the Philippine Islands. It is understood this law was enacted for the purpose of preventing large remittances by means of money orders in a way that might disturb the parity of Philippine and United States currency. The clause in the law providing that no more than 10 orders may be purchased at the same office by one person payable to the same person or firm in anyone day, as well as the material increase in the fees, will, without question, result in considerable reduction in the money-order business; but the increase in the fees on orders purchased by persons in Manila who can not purchase gold standard drafts, and by those in the provinces where no other means of remittances are available, will more than offset the loss in business at Manila.

It is difficult to justify this material increase in fees on the ground that the cost of actual shipment of gold is 75 cents per hundred dollars, to persons who know that no such shipments are actually made, but that on the contrary all money-order balances due the United States are settled by simply depositing the amount with the insular treasurer to the credit of the United States Government, where it is made available for Army expenditures in the islands. Considerable criticism of this action of the Commission has come from persons having this knowledge of the situation.

It was the entire last year to establish money-order business at at least ten additional offices but this could not be done on account of lack of funds with which to purchase the necessary safes. These extensions will be made during the present year if the appropriations permit.

In my last report mention was made of the fact that while negotiations were underway for the establishment of money-order conventions with Japan, Hong-kong, and Singapore, no definite arrangements had been reached. Nothing further has been accomplished, but these questions will be taken up again at an early date, and it is hoped that satisfactory arrangements for direct exchange of money orders with these countries will be accomplished.

REGISTRY BUSINESS.

The registry business compared with the previous fiscal year is as follows:

Total number of pieces registered, paid and free, 245,831, increase 12 per cent.
Total number of pieces registered mail received from the United States, 34,443, increase 412 letters and 4,655 parcels.

Total number of pieces registered mail received from foreign countries 52,708, increase 650.

Total number of pieces sent to the United States 39,692, decrease 1,040.

Total number of pieces sent to foreign countries 37,687, increase 1,344.

Total number of articles registered sent to other Philippine offices 168,452, increase 25,759.

Total number of pieces registered mail handled by the Manila post-office 297,750, increase 6 per cent.

During the first six months of the year when all branches of the civil government enjoyed free registration, 20,919 pieces were registered free at Manila by the various bureaus of the government. During the last six months, when registry fee and postage had to be paid by these bureaus, but 5,211 pieces were registered, more than two-thirds of which originated with the court of land registration and were notices which by law must be sent by registered mail.

As there was a decrease of over 75 per cent in the number of pieces of official mail registered when postage and fee had to be paid, it is evident that under free registration a vast amount of mail of small value, or of no importance, was registered.

INTERISLAND MAIL TRANSPORTATION.

Interisland transportation by steamers was about the same as during the preceding year, with possibly a slight reduction in the number of commercial vessels in operation. The postal service in this respect will be materially improved by the regular service that will be furnished under the contracts recently made with several steamship companies, but which did not go into operation until after the close of the year. This service, taken in connection with the Army transports running on regular schedules, and with the other commercial vessels that will be operated, should provide a reasonably satisfactory service to all of the more important ports in the islands. The advantage of knowing in advance the date on which a steamer will sail, and the ports to which it will go, are of the greatest advantage to not only the postal authorities, but to the business interests as well.

The transportation of mails by land and inland waters has materially improved since my last report. At the close of the year we had 7 American and 305 Filipino mail contractors and carriers, employed carrying the mails on 227 different routes the aggregate length of which is 4,040 miles.

The total number of miles mails were carried during the year is 605,614, and the average cost per mile traveled was $9\frac{6}{10}$ centavos, which is a decrease of $2\frac{1}{10}$ centavos per mile, or nearly 22 per cent on the cost per mile carried for the previous year. During the previous fiscal year a reduction of 30 per cent in the average cost per mile for inland transportation was accomplished. Owing to the high cost of mail transportation in the Cagayan Valley, and in several other localities, very little further reduction can be expected.

In providing transportation to 61 additional post-offices and improving the service in other places, the annual mileage was increased over 30 per cent, but on account of reductions secured the annual cost for this class of transportation was increased less than 2 per cent.

In my last report recommendation was renewed for the employment of a mail launch in Manila Bay, so as to provide expeditious handling of mails to and from vessels. This expense, which was authorized last February, and the cost of transportation for mails on the Cabanatuan Branch of the Manila Railway Company, Limited, covers the entire increase in inland mail transportation.

During the year the Manila post-office dispatched 16,227 mails, consisting of 18,061 locked pouches and 23,290 bags of papers, to provincial offices, and received from provincial offices 12,919 mails, consisting of 13,883 locked pouches and 5,109 bags of paper mail.

Postal clerks on steamers of the bureau of navigation distributed 8,098 packages of letters and 1,128 sacks of paper mail. These clerks handled 8,135 registered packages and 1,413 registered sacks and traveled 138,405 miles.

Clerks employed on the Manila and Dagupan Railway distributed 49,666 packages of letters and 4,040 sacks of papers. They handled 22,847 registered packages and 1,115 registered sacks and traveled 89,245 miles.

MAIL COMMUNICATION WITH THE UNITED STATES AND FOREIGN COUNTRIES.

The following is a concise statement of the mails sent to the Philippines from the United States and dispatched to the United States:

Number of mails dispatched from the United States 119, an increase of 33.

Number of pouches of letters dispatched from the United States 691, a decrease of 122.

Number of pouches of registered mail dispatched from the United States 2,043, an increase of 201.

Number of sacks of papers dispatched from the United States 14,139, an increase of 691.

Number of mails sent to the United States 110, an increase of 26.

Number of pouches of letters sent to the United States 774, a decrease of 111.

Number of pouches of registered mail sent to the United States 927, a decrease of 165.

Number of sacks of papers sent to the United States 1,915, an increase of 398.

There was a sufficient number of consolidations of the several dispatches of mails made from the United States while en route to the islands to reduce the number of arrivals here to 81; and consolidations en route of the 110 mails dispatched to the United States reduced the number of different arrivals at United States ports to 70.

During the year the United States postal authorities have made a fuller use of steamers sailing from northern ports in the forwarding of our mail, and the ground for the complaints made a year ago that this was not done no longer exists.

Nine hundred and seventy-five bags of mail were sent to United States ships and troops stationed in foreign ports, and 198 bags were received from such sources. The mails exchanged with foreign countries were as follows:

Number of mails received from foreign countries, 514, an increase of 69.

Number of bags received from foreign countries, 4,913, an increase of 457.

Number of mails sent to foreign countries, 485, an increase of 103.

Number of bags sent to foreign countries, 2,828, an increase of 403.

Net weight of letters sent to foreign countries, 5,559,499 grams, a decrease of 347,985.

Net weight of prints sent to foreign countries, 16,223,487 grams, an increase of 438,907.

The payments to commercial vessels for carrying our mails to foreign ports amounted to ₱13,373.12; and to foreign countries for transportation of our mails, ₱16,921.89.

TELEGRAPH DIVISION.

Under the provisions of the reorganization act the transfer of the telegraph division of the bureau of constabulary became effective January 1. The officers, district inspectors, operators, and linemen transferred numbered 307. There were 2,574 miles of land telegraph line, 198.6 miles of cable line, and 2,160 miles of telephone line transferred. During the year, 172 miles of land telegraph line and 29.4 miles of cable line were transferred from the Signal Corps to the telegraph division; 147 miles of new telegraph line were rebuilt; and 863 miles were reconstructed or given extensive repairs. Fifty-six miles of telephone lines were abandoned and the material recovered for use elsewhere. Thirty-three miles of telegraph lines were changed to telephone, and 24 miles of telephone lines were changed to telegraph.

The expenses for construction, maintenance, and repair of telegraph and telephone lines during the last six months of the year were as follows:

Construction, new telegraph lines-----	₱10, 101. 80
Repair, old telegraph lines-----	5, 071. 06
Construction, new telephone lines-----	900. 00
Repair, old telephone lines-----	3, 462. 26
Material and supplies and transportation for same-----	15, 873. 71
Linemen, salaries-----	60, 446. 64
Linemen, transportation-----	4, 850. 57
Total -----	100, 706. 04

The above includes the authority granted in May for the building of a new telegraph line, just completed, from Tayug, Pangasinan, to Bayombong, Nueva Vizcaya, a distance of 60 miles, at a cost of about ₱10,000. The

construction of this line was desired in order that 120 miles of the old Spanish line between Cabanatuan, Nueva Ecija, and Bayombong, Nueva Vizcaya, which would cost at least ₱60,000 to reconstruct, might be abandoned. The reduction in operating and maintenance expenses that will be made when the new line is in full operation will, within two years, pay for the new construction.

But the greatest benefit of the new line will be the saving in time for the transmission of telegrams to and from the Cagayan Valley. Hereafter under good weather and line conditions offices in the Cagayan Valley will work direct with Manila. Heretofore every telegram had to be relayed at San Isidro and again at Bayombong, causing not only additional work, but loss of time in transmission.

The examiners' division of the office of the Chief Signal Officer, charged with the duty of checking the telegraph accounts of each telegraph office, was also on January 1 transferred to the bureau of ports.

The following is a statement of the revenues and business done at both Signal Corps and insular offices:

July 1 to December 31, 1905:

Commercial telegrams sent from Signal Corps offices	₱37,466.75
Commercial telegrams sent from insular offices	24,939.59
Total	₱62,406.34

Total number of telegrams sent from all offices, 272,507.

January 1 to June 30, 1906:

Commercial telegrams sent from Signal Corps offices	₱41,430.28
Commercial telegrams sent from insular offices	32,743.82
Total	74,174.10

Total revenues from commercial telegrams 136,580.44

Civil government paid sent from Signal Corps offices	₱16,036.98
Civil government paid sent from insular offices	22,724.98

Total 38,761.96

Total number of telegrams sent from all offices, 224,416.

Total revenues for year 175,342.40

Total revenues for fiscal year 1905 120,077.56

Value of civil government telegrams sent free July 1 to December 31, 1905 161,953.80

Value of United States Government telegrams sent free July 1 to December 31, 1905 86,400.19

Value of United States Government telegrams sent free January 1 to June 30, 1906 93,764.14

Total value free business 342,118.13

Total number of messages sent from all offices for year, 496,923.

Total number of messages sent from all offices for fiscal year 1905, 516,920.

The above statement shows an increase of ₱16,502.88, or 13 $\frac{7}{10}$ per cent, over the commercial business of the preceding year. The increase during the last six months of the year was 18 $\frac{1}{10}$ per cent over the first six months of the year.

The total number of messages sent from all offices is 19,997, or 3 $\frac{1}{10}$ per cent, less than the year before, while during the last six months of the year there was a drop of 48,091, or 17 $\frac{1}{10}$ per cent, from the total number sent during the first six months of the year.

The value of messages sent by the several bureaus and branches of the civil

government during the first six months of the year when free service was enjoyed was ₱161,953.80, while during the last six months of the year, when, by the provisions of the reorganization act, regular commercial tolls were imposed, the value amounted to only ₱38,761.96, a reduction of more than 76 per cent. Had the privilege of free business for the civil government continued, the total number of messages sent from all offices would have been more than 550,000.

The telegraph rates in force during the first six months of the year were as follows:

Between two offices on the same island, 2 cents, United States currency, per word; minimum charge, 20 cents.

Between two offices on different islands, 4 cents, United States currency, per word; minimum charge, 40 cents.

On January 1 a change was made, removing the minimum charge and establishing a flat rate of 3 cents, United States currency, for each word, including address and signature, between any two telegraph offices in the islands. While this change had the effect of increasing the local rates, it correspondingly reduced the interisland rate and had the effect of encouraging telegraphic communication between the more distant offices.

The plan of collecting all telegraph charges by means of postage stamps affixed to the telegram by the sender, which is similar to the practice in the government telegraph service in India and Australia, was also adopted, and seems to be working very satisfactorily. At first there was some complaint because of the fact that postage stamps could not always be obtained, but this was overcome by putting stamps on sale in each telegraph office. The advantages of this system are that, if strictly complied with, the sender of a message can not be overcharged and the difference taken by the operator, and the necessity for telegraph offices rendering a separate money account of tolls collected is avoided.

There are at present 161 telegraph offices, 65 of which are operated by the Signal Corps and 98 by the telegraph division. The Signal Corps still retains control of the through line from Manila to Zamboanga, and the line to southeastern Luzon as far as Pasacao.

During the latter part of the year steps were taken for the transfer of additional military lines and offices now operated by the Signal Corps. The military authorities desired to transfer to the insular government all lines and offices thereon, except the one through wire from Manila to Zamboanga, but nothing was accomplished except the authority, received since the close of the year, to take over the short line from Manila to Mariveles.

It is understood that when the transfer of this line is completed, the weather bureau will install a typhoon signal station at our telegraph office on Corregidor Island, and that the operators will attend to the hoisting of signals. This service should be of great value to passing vessels, as it will give them up-to-date information regarding weather conditions in the vicinity of Manila.

We have 450 telephones installed throughout the islands, which are located in post-offices, and in the offices of insular, provincial, and municipal officials.

Heretofore no charge has been made for telephone service, but plans are about completed to make it a pay service so as to derive some revenue therefrom. It is believed that this change will materially improve the telephone service in that it will reduce the volume of communications to about the same extent that the civil government telegraph business was reduced since commercial tolls have been imposed. If this reduction occurs, reasonably prompt telephone communication ought to be had at all times between telephone offices, whereas under the present free service the lines are almost constantly in use and on that account urgent business is often delayed.

The cost of operating and maintaining the present telephone lines is approximately ₱120,000 per annum. It is estimated that a revenue of possibly ₱50,000 per annum can be secured if lines are kept in good condition all the time, but this amount will not be a clear gain to the government, as it will be necessary to employ telephone operators, or increase the salaries of postmasters at many places, to offset the additional work imposed. Furthermore, it will be necessary, when charges are imposed, to expend a considerable sum in the reconstruction and rebuilding of telephone lines, as many of them are now in a condition far from good, and many changes must be made in order to properly control the use of the lines and insure collection of tolls for all service rendered.

DEPREDACTIONS, LOSSES, DEFALCATIONS, ETC.

During the year, 50 cases of depredations, losses, defalcations, robberies of post-offices, and robbery of the mails, as follows, were developed:

The former postmaster at Naguillian, La Union Province, was tried for pilfering from the mails and received a sentence of four years' imprisonment.

The former postmaster at Camiling, Tarlac, was charged with opening registered letters mailed at his office and removing contents, or part thereof, and was in due time tried before the court of first instance of that province, but before the judgment of the court was rendered, the records were burned in the recent fire of the provincial building, and a new trial has been ordered.

The expostmaster at Santa Maria, Ilocos Sur, was tried for theft of merchandise from the mails, but acquitted on the ground of insufficient evidence to convict.

A clerk in the Manila post-office was tried for removing stamps from the mail and given a sentence of three months; and another clerk was tried for stealing merchandise from the mails and received a sentence of four months.

A clerk in the Los Baños, La Laguna, post-office, at the instigation of another party, stole five blank money-order forms and advices, issued them for various amounts on other offices, and with the assistance of this party secured payment on three. The principal received a sentence of seven months and the clerk four months.

The postmaster at Moncada, Tarlac, was held responsible for the loss of ₱6, stolen from two registered letters, on account of allowing the mail carrier to have access to the mail key.

The postmasters at Pilar, Sorsogon, and Namacpacan, La Union, also at Olon-gapo, Zambales, were held responsible for certain losses in their offices, on account of permitting unauthorized persons to have access to the mails.

The postmaster at Calbayog, Samar, was required to make good ₱11.80, the value of a registered letter lost in his office, on account of carelessness in handling. The postmaster at Bulan, Sorsogon, was required to make good the amount of ₱49, stolen from two registered letters, which losses he failed to report until called upon, and then first stated that the letters in question were destroyed during the September typhoon.

The postmaster at San Miguel, Bulacan, was held accountable for the loss of ₱10, postal funds stolen from his office, on account of failure to take proper care of same. One registered letter of no value was also stolen.

The postmaster at Polo, Bulacan, was required to make good ₱8, the value of a registered letter stolen from his office, on account of carelessness in handling.

The postmaster at Sorsogon was required to make good ₱60, the value of nine registered letters stolen from his office, either on account of failure to lock the safe or of permitting the keys to fall into unauthorized hands.

Last August the post-office at Tacloban was entered and ₱651 money-order funds in silver stolen. The postmaster was held accountable for the amount taken, on account of failure to take proper precautions to protect his funds.

The post-offices at Hagonoy and Baliuag, Bulacan province, were robbed of two and four registered letters respectively, but of no value.

On May 19 the mail carrier from Baguio to Dagupan lost two pouches of mail crossing a river near Pozorrubio during high water. These pouches were subsequently found and rifled by two Filipinos, whose cases are now pending in the court of first instance.

On April 22, and again on May 25, the mail carrier between Ormoc and Palo, Leyte, was held up by pulahanes and robbed of the personal funds in his possession, but the mail was not molested.

A registered letter mailed at Sorsogon alleged to contain ₱35 reached destination without contents. Upon investigation it was found that the letter was not mailed by the sender, but intrusted by him to another party, who evidently stole the contents.

A package mailed at Manila by W. G. Hollis, of the Manila Times, and said to contain ₱200, was received at destination with the money missing. Investigation developed the fact that the money was not inclosed by Hollis, and subsequently Hollis admitted this.

A party at Los Baños, La Laguna, not in the employ of the Bureau was convicted on a charge of opening mail for other persons which came into his possession, and received a sentence of one month and one day.

Improper delivery was made by a clerk in the Manila post-office of a registered letter alleged to contain ₱24. It subsequently developed that the addressee and the party to whom delivery was made connived to steal the contents. They were convicted and each received a sentence of two months' imprisonment; and the clerk making the wrong delivery was held responsible for the amount involved.

Ten additional cases of alleged abstraction of contents of registered mail are incomplete and still under investigation.

The expostmaster at Valladolid, Negros Occidental, reported robbery of his office last April, and the theft of stamped stock to the value of ₱40.99. Investigation developed the further fact that three registered letters, said to contain ₱167.50, were also missing, but not reported by the postmaster. Further investigation made it evident that the robbery was a fake. The postmaster has since been charged with the crime, and the case is now pending in the court of first instance.

A policeman at Bayambang, Pangasinan, having obtained possession of a money order, forged the signature thereon, and secured payment. He was given a sentence of four months and one day, and a fine of 325 pesetas.

The expostmaster at Ilagan, Isabela Province, was found short \$981 United States currency in his money-order funds. He subsequently confessed, but the case is still in the courts.

Last February a remittance of ₱1,800 money-order funds was made from Manila to the postmaster at Masbate. The postmaster there reported finding ₱100 in currency loose in the sack, but no other evidence of the package. Investigation developed sufficient evidence to justify charging him with misappropriation of public funds, for which he was in due time tried, but found not guilty by the court, the judgment being that the prosecution failed to conclusively prove delivery of the package in good condition into the hands of the postmaster, but that had such delivery been proven, it would, in connection with the evidence produced against the postmaster, have been sufficient to have found a verdict of guilty. By direction of the governor-general steps have since been taken to recover the amount involved, on the bond of the postmaster.

The post-office at Marikina, Rizal Province, was burned in the fire which almost totally destroyed that town, resulting in a loss of stamps to the value of ₱18.80.

In the burning of the provincial building at Tarlac, in which the post-office at that place was located, stamped stock to the value of ₱705.95 was burned, but in neither case, so far as known, was any mail lost. In the latter case the postmaster made the most heroic efforts to save everything, and, in fact, had to be held back by others to prevent him entering the building when it was extremely dangerous to do so.

There were two pouches and seven sacks of mail on the steamship *Cantabria* lost in the September typhoon, none of which were recovered.

Postal Clerk George B. Parker lost his life in the wreck of the coast guard cutter *Leyte* on the coast of Samar in the typhoon of September 26, 1905. There were also 25 pieces of registered mail and a considerable amount of ordinary mail lost. Some of the mail was subsequently found in the possession of natives living near the wreck. Three of them were convicted and given a sentence of one year three months and twenty-nine days each for looting the mails.

The steamship *Legaspi*, which left Hongkong in December, 1904, with 103 pieces of registered mail, as well as a large amount of ordinary mail, was lost at sea, and no mail recovered. Mention of this case should have been made in last year's report.

CONCLUSION.

The Philippine postal savings bank law was enacted May 24, 1906, but did not become operative during the year. This institution, when in full operation, should be of incalculable benefit to the Filipino people as it will furnish an absolutely safe and secure place for deposit of savings in almost every municipality in the islands. The savings bank will doubtless also be made use of by many Americans and Europeans who now make their savings by means of money orders.

One of the objects of transferring the telegraph division to the bureau of posts was to save expense to the government by combining the positions of telegraph operators and postmasters. This consolidation has been very successful. The operators, with but a very few exceptions, rapidly learned the postal work,

and are now giving reasonable satisfaction as postmasters and operators. Just before January 1 an anonymous telegram was sent from Manila to many operators in the provinces urging them not to accept post-office work, or permit the combining of the positions of postmaster and operator. After the dismissal of three operators who refused to accept a position as postmaster and operator no further objections on the part of the other operators were made.

The work in the Manila office has been extremely hard and difficult during the last year owing to the great increase caused by the addition of the telegraph division and the transfer of 80 post-offices during the month of January to telegraph operators, but few of whom had had any previous experience in postal work, and by the great number of resignations of American clerks who returned to the United States.

Respectfully submitted.

C. M. COTTERMAN,
Director of Posts.

To the SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

EXHIBIT E.

REPORT OF THE DIRECTOR OF NAVIGATION.

BUREAU OF NAVIGATION,
Manila, P. I., August 7, 1906.

SIR: I have the honor to submit the following report of the bureau of navigation (formerly the bureau of coast guard and transportation) for the fiscal year ended June 30, 1906:^a

REVENUE COLLECTIONS.

The amount of revenue actually collected from freight and passengers, cutter and launch hire, and other sources not refundable, was ₱192,091.85.

MARINE RAILWAY AND REPAIR SHOP.

Act No. 1416 provided a permanent reimbursable fund of ₱25,000 to serve as cash capital for operating the marine railway and repair shop. All work performed was to be deposited to this fund, and all expenses of maintenance were to be paid out of it. This fund was created as of July 1, 1905, although the act was not passed until the latter part of October.^b

Up to the passage of the act (No. 1416) providing for the separate appropriation for the shop, the cost of maintenance was borne by the division of vessels, both in labor and material. Material is still being supplied from the same source. The division of vessels is being reimbursed in kind for the expenditure.^c

The appropriation of ₱25,000 must always be available either in cash, or unfinished work, or bills receivable.

In a statement of the assets and liabilities of the fund to June 30, 1906, it will be noted that the apparent profit in the statement of assets and liabilities exceeds the amount as shown by the statement of maintenance and work performed. This excess is due to the fact that work performed during the fiscal year of 1905 for the light-house service was not collected until the appropriations for that year had been written off. The cost of this work was not borne by the shops, but by cutters and launches, 1905. It could not be deposited to the latter appropriation for the reason that it has ceased to exist. It was deposited to the shops, by direction of the auditor; hence the increase.

Mr. Seifert resigned at the close of June 30 to accept a position with Messrs. J. G. White & Co.

What is known as the card system, whereby each workman keeps his own time (which is O. K'd by foremen and checked by timekeepers), was introduced in all departments during May, 1906, and has been found to work most satisfactorily.

During the months of May and June the marine railway on Engineer Island, including the ways, cradle, etc., was given a thorough examination and found to be in excellent condition, and advantage was taken of the extreme low tides to scale and paint the ironwork of the cradle.

The buildings on Engineer Island have been examined for white ants and none found in the new or permanent buildings, through many are to be found in

^a Financial statements accompanying this report are on file in the War Department.

^b A report of operations, assets, and liabilities accompanying this report is on file in the War Department.

^c A statement of the account to date is on file in the War Department.

some of the cheap, temporary buildings which were on the island when it was turned over to this bureau.

The work of filling Engineer Island was practically completed.

An oil house of concrete and steel, 60 feet long by 40 feet wide, was constructed on Engineer Island and a steel boiler shed begun.

A hoisting engine for the derrick was installed.

Early in the fiscal year a large and powerful Deane fire pump was installed.

An addition to the office of the superintendent of interisland transportation was built, costing approximately ₱2,000.

The undersigned, by order of the Secretary of the Navy, accompanied Governor-General Wright to the United States, leaving Manila on November 4, 1905, and returning on April 22, 1906. During his absence the bureau was in charge of Mr. F. P. Helm, assistant director.

INTERISLAND TRANSPORTATION DIVISION.

The following is taken from the report of Mr. R. M. Corwine, superintendent of interisland transportation:

"The office of the superintendent of interisland transportation was opened July 1, 1905, in compliance with act No. 1310, entitled 'An act to encourage and aid the Philippine coastwise trade, to secure the carriage of mails, government freight and passengers by commercial vessels under contract, to effect uniform reasonable rates for the government and public, to increase the safety standards and service of contracting vessels, and for other purposes.'"

The duties previously devolving on the marine superintendent in regard to transportation on and rental of vessels belonging to this bureau were transferred to this office. Subsequently by the provisions of act No. 1414 I assumed the duties formerly pertaining to the purchasing agent in the matter of transportation of officials and employees of the government on the Manila and Daguapan Railroad and on commercial vessels.

On March 1 the acting secretary of commerce and police opened six bids on the proposed interisland routes. Five of these were from the Compañía Tabacalera and one from the Manila Shipping and Transportation Company (Limited). After the return of the Hon. W. Cameron Forbes, secretary of commerce and police, to Manila, eight bids were received from the Compañía Marítima and one from Smith, Bell & Co. On consideration by the Philippine Commission all of these bids were accepted with certain modifications, with the exception of route 8, Compañía Marítima, which was rejected.^a

N. B. In July, 1906, contracts were entered into and commercial boats commenced carrying government traffic and running over routes agreed upon. Only one cutter of this bureau now operates over a regular route—this between Manila and ports in Palawan Province.

DIVISION OF VESSELS.

Mr. F. P. Helm, in charge of this division, was promoted on November 1, 1905, to the newly created position of assistant director of navigation. James Miller, formerly captain of the cutter *Tablas*, was appointed marine superintendent, vice Helm, promoted.

The following information in regard to this division is taken from the report of the assistant director of navigation.

Vessels owned and operated by this division are: ^b

Cutters.—Negros, Busuanga, Luzon, Balabac, Polillo, Palawan, Basilan, Mindanao, Samar, Mindoro, Panay.

Seagoing launches.—Ranger, Rover, Troy, Malecon, Philadelphia, Guy Howard, Cabra, Siasi, Ogden.

Harbor launches.—Jolo, Bohol, George Tilly, Cuyo, Norte, Suerte, Polaris, Diana, Pepe, Igorrote, Arc, Tender.

The *Marinduque*, a cutter, is owned by the division, but loaned indefinitely to the United States Coast and Geodetic Survey. This bureau bears no expense connected with her.

Of the vessels named in the foregoing list, a number were received during the

^a A statement of transportation furnished is on file in the War Department.

^b Statement of cost of maintenance and repair of these vessels is on file in the War Department.

course of the year and were not owned by the bureau during the entire year. Others which were in possession of the bureau throughout the year were operated only part of the time. The *Malecon*, *Norte*, and *Diana* were received from the bureau of port works on November 1, 1905. The *Arc* was received from that bureau on March 14, 1906. The *Guy Howard* was received from Samar Province, and the *Polaris* from the cold storage and ice plant on November 1, 1905. The *Siasi* (formerly *San Antonio*), was received from Mindoro Province on January 18, 1906; the *Ogden* from Leyte Province on March 5, 1906, and the *Jolo* (formerly *Sultana*) from the Philippine constabulary on November 27, 1905. The *Balabac*, *Basilan*, *Cabra*, *Pepe*, and *Igorrote* were "laid up" part of the time. Therefore the statement of amounts expended on their operation and maintenance does not represent their full yearly cost.

The division also controls and operates—

Eleven lighters of various sizes, valued at ₱11,500. (Six large and four small lighters were transferred to it from the purchasing agent early in the year, but two of these have been condemned and dropped.)

One cargo boat, valued at ₱700.

The estimated value of the fleet is ₱1,743,994.58.

The value of the stores on hand in the storehouse is estimated at ₱211,313.16; spare parts of machinery in the storehouse, ₱42,856.60; machines, etc., in machine shops, ₱157,706.15; small tools in shops, ₱1,879.43; marine railway, ₱223,959.13; ordnance on board vessels, ₱93,681; supplies and equipment on cutters and launches, ₱242,737.44; derrick and hoisting engine used in connection with the shops, ₱4,570; one fire pump on Engineer Island, ₱4,561.52.

Total value of the division of vessels, ₱2,739,399.01, exclusive of buildings, grounds, and fixtures.

Early in July, 1905, parties were organized to try and float the cutter *Masbate*, which stranded on a reef off Hignunum Island, northeast coast of Samar, December 15, 1904. Work was continued at intervals until September. Skids and cradle had been fitted under the *Masbate* and a channel blasted out of the coral reef and all was ready to float her when the disastrous typhoon of September 25, 1905, destroyed all preparations and carried the wreck some 150 feet farther up on the reef and left the vessel in such condition that it was thought she was not worth the expense necessary to float her.

The same typhoon caught the cutter *Leyte* in San Bernardino Strait a little before midnight of September 25 and drove her onto a rocky point some 3 miles from Allen (La Granja), province of Samar, where she was broken to pieces. Among the lost were Capt. W. N. Fisher, First Officer G. W. Hellberg, Second Officer E. M. Bentel, Chief Engineer G. Gardner, Assistant Engineer C. J. Olsson, and Postal Clerk George B. Parker. There were also 23 of the native crew and 6 American passengers lost, making a total of 35 lives. The only survivors were 8 Filipino seamen and the Chinese steward. These men were washed overboard by the waves when the ship struck, and found themselves landed without knowing how, when, or where. Every effort possible was made by the vessels of this bureau and by Governor George Curry and other officials of Samar Province to find the bodies of those drowned, but with little success. Such remains as were found were difficult to identify, but were given every care and attention.

The worst part of this typhoon is supposed to have passed over the cutter *Basilan*, Capt. Thomas A. Hillgrove, which was anchored in what is known as Frank Helm Bay, on the northeast coast of Samar. She had three anchors down and all her chain out and for four hours steamed full speed to her anchors. Everything on her upper deck, such as awning stanchions, ventilators, boats, etc., was carried away. Her doors were smashed in and the engine room and bilges flooded with water. At one time, probably when the center of the typhoon was passing over the ship, she was struck by what appeared to be a tidal wave, which threw her on her beam ends. In the darkness, confusion, etc., the people did not know what had struck her. For a full account of this typhoon and the experience of the *Basilan* and other vessels, see the weather bureau bulletin for September, 1905, in which the typhoon is described as the *Cantabria* typhoon. The *Basilan* came out as soon as the gale was over, and for some two weeks thereafter did most useful work in going to the relief of wrecks and stranded vessels all along the coast before coming to Manila to have her own damages repaired.

The total work performed by the cutters was: Distance cruised, 255,831 miles; ports visited, 3,193; passengers carried, 16,091; freight carried, 2,900 tons. Considerable money and mail was also carried.

The seagoing launches were used principally in the service of the constabulary, and the smaller launches were employed around Manila in the river and harbor.

LIGHT-HOUSE SERVICE.

The separate divisions of light-house construction and light-house maintenance were combined on November 1, 1905, by act No. 1416 of the Philippine Commission, into one division, known as the light-house division, and placed in charge of the light-house engineer.

The following list of lights is taken from reports of the light-house engineer: ^a

Apo Reef.	Jolo.
Bagacay.	Lanis.
Bagatao.	Legaspi.
Balabac.	Lipata.
Balayan.	Linao.
Batangas.	Little Santa Cruz.
Bauan.	Lucena.
Boac.	Luzaran.
Bojeador.	Mactan.
Bolinao, Cape.	Malabrigo.
Bolinao, Port.	Manigonlgo.
Bongao.	Malinao.
Breakwater.	Mati.
Bugui.	Melville.
Caballo.	Napindan.
Cabra.	Opon.
Cagayan.	Ormoc.
Capul.	Overton.
Capitancillo.	Palanog.
Capiz.	Pandan.
Carigara.	Pasig.
Capones.	Pitogo.
Calbayog.	Polo Point.
Calabazas.	Pollok.
Calapan.	Puerto Princesa.
Canauay.	Romblon Range.
Canal.	Sabang Point.
Candon.	Sangley.
Canigao.	Salomague.
Catbalogan.	San Bernardino.
Corregidor.	San Fernando Point.
Cuyo.	San Fernando Range.
Cullon.	San Jose.
Currimao.	San Nicolas Shoal.
Cotabato.	San Pedro.
Dagupan.	Santiago.
Dayao.	Siete Pecados.
Dumaguete.	Subig Bay.
Engaño.	Surigao.
Escarceo.	Tacloban.
Galera.	Tagolo Point.
Gigantes.	Tay-Tay.
Hermana Mayor.	Tanguingui.
Iloilo Jetties.	Zamboanga.
Jintotolo.	

The report of the light-house engineer also shows the following:

At the close of the fiscal year there were 38 beacons in place and 86 buoys.

The light-houses, beacons, and buoys in question are all described in the List of Light-Houses, Beacons and Buoys of the Philippine Islands.

Cost of operating light-house tenders *Corregidor, Romblon, Tablas*, and *Picket* during the fiscal year 1906 was ₱151,100.30.^b

^a Statement of cost of maintenance and cost of repairs is on file in the War Department.

^b Detailed statement on file in War Department.

The cutter *Romblon* was indefinitely loaned to the United States Coast and Geodetic Survey commencing November 1, 1905, and the *Tablas* on that date was transferred from the division of vessels to this division to replace the *Romblon*, so that the total of ₱151,100.30 represents about the cost of operating two cutters and a large seagoing launch as light-house tenders for the year.

Exclusive of grounds, buildings, etc., the value of the property of the division is estimated at ₱483,248.37, made up of ₱176,748.37 account supplies in store-houses, light-houses, and vessels, and ₱265,000 as valuation of the light-house tenders *Corregidor*, *Tablas*, and *Picket*.

It is expected that during the fiscal year 1907 five or six of the cutters will be "laid up" as a measure of economy, practically only special duty for the constabulary and other bureaus of the government being required instead of the previous constant and regular operation of vessels over routes to provide passenger, freight, and mail-carrying facilities for government business to nearly all ports throughout the islands. This will probably result in a saving of ₱250,000 per annum, so far as the expenses of this bureau are concerned.

The vessels of the fleet are in good condition and seem numerous enough and properly equipped to perform all the work they may be called upon to do, though the putting out of commission of some of the cutters, and the fact that it is usually difficult to secure competent officers, may result in delay and embarrassment in the event of an emergency arising which makes their use again imperative.

Recommendation has been made that the light-house division be allowed ₱150,000 for the construction of two large light-houses and ₱50,000 for various small lights. It is believed that, while much of the necessary work has been done during the past few years in the placing of lights to safeguard navigation, the work should be continued at a moderate pace, and at least the ₱200,000 desired for new lights be made available for expenditure at this time.

Very respectfully,

J. M. HELM,

Commander, U. S. Navy, Director of Navigation.

To the SECRETARY OF COMMERCE AND POLICE.

Manila, P. I.

EXHIBIT F.

REPORT OF THE DIRECTOR OF PORT WORKS.

MANILA, P. I., August 9, 1906.

SIR: This bureau was known as the office of port works until November 1, 1905, when by act No. 1407 of the Philippine Commission it became the bureau of port works.

Officers in charge: Maj. C. McD. Townsend, Corps of Engineers, U. S. Army, to include August 15, 1905; Lieut. Col. Walter L. Fisk, Corps of Engineers, U. S. Army, August 16, 1905, to date.

IMPROVEMENT OF THE PORT OF MANILA.

This work is being carried out under acts of the Philippine Commission Nos. 22, 101, 182, 199, 578, 674, 1047, 1176, 1246, 1342, 1360, 1449, and 1479, which appropriate ₱10,196,000 in all, of which a total of ₱8,966,022.08 has been expended to June 30, 1906.

For description of the Spanish project for the harbor reference is made to the last annual report submitted by Maj. C. McD. Townsend, Corps of Engineers, U. S. Army, then in charge of this office.

The present project is shown by the accompanying plan (pl. 1^a) and includes the original west breakwater of the Spanish plan extended 492 feet; an additional breakwater 3,000 feet in length approximately parallel to the original shore line and separated from the west breakwater by an entrance 710 feet in width at low water. The walls constructed under the Spanish project have been utilized to form a small inner basin 18 feet deep at low water; from this a bulkhead about 1,800 feet from the old shore line extends to the line of the east breakwater of the Spanish project. In front of the Luneta another bulkhead follows the lines of the Burnham plan and the two provide the space necessary to hold the material to be excavated from the 350 acres of harbor area which is to be 30 feet in depth at low water. An extension of the east breakwater 1,000 feet in length to keep out of the harbor the material which would otherwise wash in from the shoal area in front of the Luneta extension and upon which can, when necessary, be built an additional wharf; and finally a system of wharves extending out from the bulkhead in front of the Malecon drive.

CONDITION OF WORK JUNE 30, 1905.

West breakwater.—Completed, except concrete foundation for light-house at its southern end.

Additional breakwater.—A length of 1,630 feet was completed to its full height of 8 feet above mean low water, and the substructure of the remaining 1,370 feet had been brought up to about low water.

Old bulkhead.—Completed from the basin to east breakwater, and the fill behind it nearly up to the required height.

Dredging.—There had been dredged from the harbor and basin 5,593,354 cubic yards, of which 701,324 yards had been placed in the old moat and the low ground south of the walled city; 7,093 yards on Engineer Island, and the remaining 4,884,937 yards behind the bulkhead, filling an area of 191.4 acres to 10.5 feet above low tide.

^a Plate 1 is on file in the War Department.

Wharves.—Plans were in course of preparation for two large steel wharves, one (A) to be 110 by 650 feet, the other (B) 70 by 600 feet in size.

The two additional wharves (C) and (D), shown on plan, had just been placed under contract by the Quartermaster Department of the Army.

PROGRESS DURING THE YEAR ENDING JUNE 30, 1906.

West breakwater.—The concrete foundation for the light-house, 824.4 cubic yards, was placed as a solid block, and the base protected by 1,258 long tons of riprap.

Additional breakwater.—This was completed by the placing of 33,565 long tons of rock.

East breakwater extension.—Twenty-one thousand nine hundred and forty-four long tons of rock were placed to December, 1905, since which time nothing has been done, in order to allow it time to settle before completing.

Luneta extension.—The timber bulkhead, 4,409 feet in length, was completed in March, and riprap to the amount of 75,347 long tons placed outside to support it against the pressure of the dredged material behind it.

During the night of May 1, 192 feet of this bulkhead near the middle of the long front curve was pushed seaward about 15 feet by the material behind it, at the same time sinking vertically about 8 feet and allowing the escape of about 116,500 cubic yards of material. Under the terms of the contract, the Government is responsible for the repair of this break, but, before this was completed, the severe typhoon of May 18 and 19 destroyed 1,539 feet more of the timber bulkhead, allowing much of the stone to fall in and about 116,061 cubic yards more of material to escape. For this break the contractors deny responsibility although the contract apparently specifically covers this case; but, pending the determination of responsibility, have proceeded with the repairs so the dredge should resume work about July 15.

Dredging.—Dredging was continued, about 523,612 cubic yards being placed in the old fill, and 848,132 cubic yards in the Luneta extension.

Wharves.—Plans and specifications for the two large steel wharves were completed, the work advertised, and bids opened April 5, 1906.

The contract was awarded to the Atlantic, Gulf and Pacific Company, the lowest of five bidders, signed on May 10, and approved by the governor-general May 24, 1906.

Plans and specifications for railways and steel sheds for these wharves were prepared and the work advertised; bids were opened May 4, 1906, but all rejected as excessive. The work will be readvertised, and new bids opened on October 15, 1906.

Old bulkhead.—Two breaks occurred in the old bulkhead, one in the inner basin, the other on the outer front, which were repaired by the use of 3,627 long tons of riprap.

Contracts.—The contract approved July 8, 1903, with the Atlantic, Gulf and Pacific Company for the additional breakwater was completed in January, 1906.

A contract was made with the Atlantic, Gulf and Pacific Company July 24, and approved August 9, 1905, for the concrete light-house foundation at the south end of the west breakwater; the Luneta extension bulkhead, depositing more dredged material on the old fill; filling the Luneta extension, and constructing the riprap foundation of the east breakwater extension.

The contract with the Atlantic, Gulf and Pacific Company for the steel wharves was signed May 10 and approved May 24, 1906.

A supplemental contract with the Atlantic, Gulf and Pacific Company for repairing the Luneta extension bulkhead break of May 1, for which the government is responsible, was signed May 24 and approved May 25, 1906, being subsequently extended to the typhoon damage of May 18 and 19, if the Atlantic, Gulf and Pacific Company establishes its claim for nonliability therefor.

REMARKS.

An examination of the breakwaters in May last shows that the riprap along the west breakwater has been considerably disturbed by the year's storms, and should be renewed during the next good weather season.

There has also been some settlement of the additional breakwater, which was, of course, to have been expected. It averages about 1 foot, and is still too small to repair. The "header" section of the superstructure, 75 feet in length, shows no settlement, and is unquestionably the best form for such work when stone of suitable size and shape can be obtained.

The old timber bulkhead around the Malecon fill has been in place over three and one-half years, and the removal of some of it at the abutment of the Quartermaster pier shows it to be badly honeycombed by teredo, so it can not last much longer. This will necessitate taking up at once the study of a permanent quay wall.

IMPROVEMENT OF PASIG RIVER.

The existing project proposes to maintain by dredging a mean low-water channel of 18 feet across the bar at the mouth up the river to the Bridge of Spain, and a 6-foot channel through the upper river at the low stage of Laguna de Bay.

At the time of American occupation there were about 12 feet at mean low water on the bar, and the channel was obstructed by a number of sunken vessels.

CONDITION OF WORK JUNE 30, 1905.

Lower Pasig River.—To obtain and maintain the 18-foot channel had required the dredging of 2,220,203 cubic yards, at a cost of ₱0.27 per yard, including all expenses and repairs.

Santa Cruz Estero.—About 2,300 feet of the channel had been dredged to a depth of 4 feet at low water, by the removal of 17,400 cubic yards of most difficult material, including stone, brick, and debris and refuse of all kinds, at a cost of ₱1.11 per yard. Included in this are all repairs and other expenses. It was necessary to dismantle the dredge at every bridge it had to pass and to dig out the material under the bridges by hand.

Upper Pasig River.—The upriver dredges had removed 196,876 cubic yards of material.

WORK DURING YEAR ENDING JUNE 30, 1906.

Lower Pasig River.—Dredging plant No. 1, working seven months, removed 299,950 cubic yards at a cost of about ₱0.14 per yard.

Dredging plant No. 2, working five months, took out 194,275 yards at a cost of ₱0.128 per yard; or a total for both of 494,745 yards at ₱0.13 per yard. This cost includes all expenses directly connected with the dredging as well as repairs and supervision.

Total dredging in the lower river to June 30, 1906, 2,714,948 cubic yards.

Santa Cruz Estero.—Four thousand five hundred and eighteen yards of material were taken out at cost of ₱0.72 per yard, completing the work to the constabulary building.

The length of estero dredged is about 2,800 feet and the total amount taken out is 21,918 yards. No further appropriations being available the two Priestman dredges used on the work were dismantled, brought out into the river, and laid up with other plant.

Upper Pasig River.—Dredge No. 3 worked three months, half of which time it was operated by the city of Manila dredging gravel for city use, the sand being allowed to escape into the river, which should not be permitted; this office has no record of its work during that time.

During the latter part of May and the month of June, the dredge has been working on the Napindan Bar at the head of the river, and has removed 16,087 cubic yards at a cost of ₱0.35 per yard.

Dredge No. 7 was not used during the year.

REMARKS.

During the year it has been possible to keep the lower Pasig River in good condition by the constant use of one dredge, and this could be done only by having one dredge relieve the other from time to time for necessary repairs. Quite extensive repairs to dredge No. 1 have been under way for some time at Engineer Island and will be completed in July; these are expected to make the dredge good for about five years more, when it will probably have to be largely rebuilt. Dredge No. 2 will probably also require considerable repairs during the coming year with a similar end in view.

In December the department of commerce and police issued orders closing the shops of this bureau, transferring some of the machinery to and requiring all repairs to be made by the bureau of navigation.

Three launches and the port works' dry dock on the north side of the river

were also turned over to the bureau of navigation; the dry dock was used but a few days and has now been turned over to the military authorities, so this bureau is now forced to pay for hauling out dredges and barges for minor repairs which it could have done for nothing in its own dock, which was built from its own funds and for which it has received absolutely no compensation. In addition this bureau is forced to pay the bureau of navigation 10 per cent advance for materials on which it (the bureau of navigation) has already paid the bureau of supply 10 per cent profit, making them cost this bureau 21 per cent more than they could often be purchased for in open market.

The entrance from Laguna de Bay into the Pasig River will probably always give trouble until a dike about 7,500 feet in length is placed on the west side to keep the sand from drifting into the dredged channel; one may also be necessary on the east side, but need not be put in until the former has shown that it is not sufficient. Plans for a dike will be prepared later, as soon as the other work in hand will permit of making a survey of the locality.

INVESTIGATIONS AND SURVEYS OF RIVERS AND HARBORS.

During the year the director of port works has personally visited the following localities with a view to determining which ones should be taken up for improvement by the insular government:

Danao River, Escalante, Ginigaran River, Jimamaylan, island of Negros.

Tagbilaran, island of Bohol.

Batan, Capiz, island of Panay.

Sorsogon Bay, Apud Shoals, Pasacao, Caiman Bay, Ragay Bay, Laguimanoc, Pagbilao, Lucena anchorage, Lampon, east coast Polillo at coal mines, Mauban, Atimonan, Apat Bay, Tabaco, Sugod, island of Luzon.

Coal harbor between islands of Batan and Cacraray.

Two survey parties were organized and sent into the field in December, 1905, to gather information as to suitability for shipping and wharves, composition of the harbor bars requiring deepening, materials available for works of improvement if undertaken, and to make surveys at places where none are already available. One party has already visited Danao River, Escalante, Batan, and Capiz, and is now at Tagbilaran. The other has investigated Dagupan, Santo Tomas, San Fernando, and Aparri, and is now in Manila with the chief of the party under treatment at the civil hospital. As the reports and maps of these parties are not yet available the detailed reports will be forwarded later.

The preliminary inspection, however, showed at once that Batan and not Capiz is the proper northern railroad terminus in the island of Panay, as it is an excellent harbor with about 24 feet depth on the bar, anchorage of ample depth, and room inside perfectly protected, plenty of room for wharves, and ground suitable for terminal purposes.

Abstract of bids opened April 5, 1906, for two steel wharves.

Milliken Brothers (Incorporated), New York	₱1,235,467.76
Healy-Tibbits Construction Company, San Francisco	1,190,466.93
Salvador Farré, Manila	1,189,639.79
Cotton Brothers & Co., Oakland	1,049,829.02
Atlantic, Gulf and Pacific Company, New York and Manila	886,046.59

Bids opened May 4, 1906, for two steel wharf sheds and wharf railways.

Different types of roof and waterproofing.	Milliken Bros. (Inc.) New York.	Atlantic, Gulf and Pacific Co. Manila, P. I.	Modern Steel Structural Co., Wauke- sha, Wis.
(a) Roof, (a) waterproofing	₱232,699.36	₱181,309.56	₱165,635.05
(a) Roof, (b) waterproofing	535,383.92	183,725.66	166,334.15
(b) Roof, (b) waterproofing	223,974.18	179,981.36	167,731.60
(b) Roof, (a) waterproofing	221,289.62	177,565.26	167,032.50

All bids on sheds were rejected as being too high.

IMPROVEMENT OF THE PORT OF ILOILO.

This improvement was provided for by acts Nos. 641 and 1342, which appropriated a total of ₱532,000 for the purpose.

The project, prepared by the bureau of engineering, provides for dredging a channel in Iloilo River not less than 15 feet in depth at low water, the construction of two jetties across the bar at the mouth of the river, and the construction of a system of dikes and levees to control the river, as described on page 211, Report of Philippine Commission, 1903, part 3.

The work was awarded to J. G. White & Co., contract entered into March 30, 1904, and they began work during the following August.

CONDITION OF THE WORK JUNE 30, 1905.

The contractors had driven 24,800 linear feet of piles; delivered 2,747 cords of fascines, of which 2,100 cords had been placed in the dikes; quarried 14,500 tons of stone, of which 13,400 had been placed in the jetties and dikes; and a 16-inch suction dredge was under construction for work in the river.

WORK DURING THE YEAR ENDING JUNE 30, 1906.

All the dikes were completed, requiring 647 cords of fascines and 7,914.9 tons of stone; a total of 2,747 cords of fascines and 13,225.9 tons of stone.

Both jetties were completed by the placing of 13,611 tons of stone, a total of 21,700 tons; and permanent lights were placed on the outer ends by the light-house engineer.

The 16-inch hydraulic dredge was completed in November, 1905, and has taken out 180,500 cubic yards of an estimated total of 450,000.

Dikes.—Some trouble was experienced during 1905 from movement outward of Dike L, which is built on very soft bottom; this led to reinforcing all the dikes with riprap, which was entirely successful except for a portion of Dike L, which gave way in April while dredged material was being placed behind it. However, no material was lost, as the movement was but a few feet and the dike was readily repaired.

At first considerable material oozed through the dikes, but this was remedied by facing them with bamboo matting, which will last until the fill has hardened by draining and settlement.

In the original plans, no provision had been made for the construction of dikes in the rear of the dikes along the river bank, to prevent the material returning to the river. These have been built at a number of places, but of a different type from the original design. At places where the bottom was at about high-water mark, a low earth dike reinforced with stone at the back has been built. At other places, in deep water, a dike composed of alternate layers of stone and fascines, gradually increasing in slope until the section is substantially triangular shaped, was built. This type was further modified in another dike by the substitution of earth for the last layer of stone, reducing the cost considerably. None of the back dikes have given trouble.

The expense of the original type of dike built of piling, fascines, and stone, as compared with the type used later of fascines and stone in alternate layers, is worth noticing. An analysis of inspectors' reports recently completed shows that the cost per linear foot of Dike M-N amounts to \$12.18, United States currency. This dike is about 2,000 feet long, averages about 8.5 feet high, and is built on practically level ground in water averaging about one-half foot below mean low water. It is an excellent example of the piling, fascine, and stone type. A dike of the other type 800 feet long and averaging 7 feet in height was built across the tide-water area, and cost \$3.82 per linear foot. The upper layer of this dike was built of earth. A dike built as high as Dike M-N with stone substituted in place of the layer of earth—a change probably necessary on account of the exposed situation—would not cost over \$6.50 per linear foot, and would be even stronger. A dike of this type is now being built by the Quartermaster Department around a portion of the military reservation which is to be filled.

JETTY CONSTRUCTION.

The plans called for the construction at the entrance of the river, of two slightly converging stone jetties, which were described in report for last year. At the close of the previous year 8,089 tons of stone had been deposited upon the jetties, being about 37 per cent of the required amount. The work was carried on vigorously until completion in December.

Some slight settlement has taken place at a few places along the jetties, but no appreciable movement of account, though they have passed two severe typhoons since completion.

DREDGING.

The hull of a 16-inch hydraulic dredge was launched from the contractor's shipyard on July 8. The installation of her machinery proceeded slowly, and actual operation did not commence until the first week in November. During November the dredge was operated intermittently, but since December 1, including delays for repairs, shifting of pipe, etc., it has been operated twenty-four hours a day.

The output of the dredge is disappointingly low. Instead of the 3,000 to 4,000 cubic yards per day anticipated, an average of about 1,000 yards of dredging that will be paid for has been obtained. The actual amount dredged is about 50 per cent better than this, as a great deal of extra material has been dredged outside of the channel limits and below grade. To date 180,500 cubic yards have been dredged. The total amount to be done amounts to approximately 450,000 cubic yards. At the present rate of progress it will take at least seven months more to complete the contract.

The following table shows a distribution of time up to May 22, 1906. The dredging done to that time was entirely to the east of Point Llorente, and the river has been cross-sectioned to that point for final payment.

Distribution of time from November 4, 1905, to May 22, 1906.

	Working.	Dredging.	Clearing stone box, suction, and pump.	Repairs.	Shifting dredge and pipe.	Other delays.
Hours	3,385.3	2,446.5	246.9	418.1	211.4	62.4
Percentage.....	100.0	72.3	7.3	12.4	6.2	1.8

	Cubic yards.
Amount material dredged.....	200, 112
Amount material paid for by government.....	133, 370
Excess material dredged, 50.4 per cent or.....	66, 742
Average amount of material dredged per working hour:	
Actual	59
Paid for	39
Average amount of material dredged per dredging hour:	
Actual	82
Paid for	55

The discharge pipe has averaged about 925 feet in length.

The material pumped so far has been almost entirely sand, making an excellent fill. Along the sea wall and at the bend of the river where the dredge is working at present, considerable ballast rock has been encountered. This has delayed the work a great deal as the pump will not pass anything of greater diameter than 6 inches. Below the bend some mud has been pumped, and from appearances this continues about half the remaining length of the river, the rest being sand.

The fill behind Dike M-N has been completed. This has been carried a foot higher than originally planned in order to dispose of excess material, and it is now above extreme high water. A very valuable piece of property of about 10 acres has been secured here. A good deal of material has been wasted at the back of this fill in a salt marsh and in the salt marsh to the north.

The fill behind Dike L has been partially completed. While material was being deposited behind this dike in April, the central portion sank about 5 feet and moved outward about 15 feet. No material was lost, and the dike was quickly repaired by building upon it a dike of fascines and stone. Enough material was brought from the sides to cover the back, but a large hole remains. It was not thought safe to deposit more material behind the dike at that time, but later this will be done when the present fill has become thoroughly settled.

The fill on the south side of the river near the bend is being carried on at present, and is about half completed. Owing to the great length of pipe from

where the dredge is working at the point, material is deposited here during the day only. At night the river is closed and material is placed behind Dike X, to which a very short pipe line is necessary.

It is a misfortune to the government that the titles to land along the river could not have been settled before the beginning of the reclamation. Land along the river front is greatly increasing in value at present, as the terminus of the railroad will in all probability be on the north bank. All of the land at the easterly end of the river is claimed by private parties, and though probably some of these claims will not be allowed, it is very likely that material has been wasted on land that is private property. This land is absolutely worthless without filling, but after filling will be worth from two to three pesos a square meter, and possibly more. As filling of not over 4 feet in depth is necessary on the north bank, a considerable area could be covered, the value of which should accrue to the government, and which would have greatly reduced the cost of the improvement under way.

IMPROVEMENT OF THE PORT OF CEBU.

This work was authorized by acts Nos. 640, 1342, and 1449, which appropriated ₱1,225,520 for the purpose.

By act No. 1339 charge of this work was transferred from the bureau of engineering to the officer in charge of the works of the port of Manila, now designated director of port works.

The original project was prepared under the direction of bureau of engineering and provides for the construction of a concrete bulkhead wall 2,600 feet long, the reclaiming of about 13 acres of land along the water front, and dredging along the bulkhead to 18 and 23 feet below mean low water, as described in part 3, page 210, Report of the Philippine Commission for 1903.

The project for the bulkhead has been modified by the substitution of concrete in mass for the concrete blocks of the original design, and the cross section of the wall has also been enlarged and given a vertical face.

Contract for the work was entered into with J. G. White & Co. (Incorporated), on March 30, 1904. Under this contract the government was to furnish the Portland cement, and on January 21, 1905, a contract for 30,000 barrels was made with the Alsen'sche Portland Cement Company.

CONDITION OF WORK JUNE 30, 1905.

Under the contract with the Alsen'sche Portland Cement Company 10,979 barrels of Portland cement had been delivered and stored.

Under the contract with J. G. White & Co. there had been erected two storehouses for cement, a concrete mixer, and a railroad $2\frac{1}{2}$ miles in length from the concrete mixer up the Guadalupe River to obtain sand and gravel for the concrete.

PROGRESS DURING THE YEAR ENDING JUNE 30, 1906.

By April 30, 1906, the delivery, test, and acceptance of 18,930 barrels completed the cement contract, the total amount delivered under it being 29,909 barrels.

The actual construction work under the contract with J. G. White & Co. has not progressed as it should, due to lack of proper plant and management.

During July and August, 1905, two pile drivers were built, a sand pump fitted up for dredging the trench for the sea wall, and a construction trestle 365 feet long built.

Actual construction was started on the bulkhead September 5, 1905, since which date the following work has been accomplished:

Bulkhead piles driven-----	126
Sheet piles driven-----	565
Foundation piles driven covering 417 linear feet of wall-----linear feet--	22,547
Fill made from trench excavation-----cubic yards--	3,125
Concrete in 20 blocks (243 linear feet of wall)-----do----	2,555.7

The total value of work done to June 30, 1906, is ₱97,604, while the total amount of the contract will be about ₱1,050,000.

The original time set for completion of the contract was February 1, 1906, which was extended in June, 1904, to September 1, 1906.

FINANCIAL STATEMENT.

IMPROVEMENT OF THE PORT OF MANILA (act No. 22, and acts amendatory thereof).

Total of appropriations and refunds to date	₱10,200,116.97
Expended previous to June 30, 1905	7,373,612.47
Expended during fiscal year ended June 30, 1906	1,592,409.61
Total expended to June 30, 1906	8,966,022.08
Balance in hands of disbursing officer	114,355.27
Balance subject to accountable warrant	1,119,739.62
Total	10,200,116.97

IMPROVEMENT OF THE PORT OF CEBU (acts Nos. 640 and 1342).

Total of appropriations and refunds to date	₱1,225,530.00
Expended previous to June 30, 1905	8,974.21
Expended during fiscal year ended June 30, 1906	242,953.22
Total expended to June 30, 1906	251,927.43
Balance in hands of disbursing officer	25,534.58
Balance subject to accountable warrant	948,067.99
Total	1,225,530.00

IMPROVEMENT OF THE PORT OF ILOILO, (acts Nos. 641 and 1342).

Total of appropriations and refunds to date	₱532,016.25
Expended previous to June 30, 1905	92,146.13
Expended during fiscal year ended June 30, 1906	207,612.32
Total expended	299,758.45
Balance in hands of disbursing officer	56,201.28
Balance subject to accountable warrant	176,056.52
Total	532,016.25

SURVEYS AND INVESTIGATIONS, PORTS OF THE PHILIPPINE ISLANDS (act No. 1449).

Total of appropriations to date	₱36,000.00
Expended during fiscal year ended June 30, 1906	17,824.60
Balance in hands of disbursing officer	2,175.40
Balance subject to accountable warrant	16,000.00
Total	36,000.00

DREDGING SANTA CRUZ ESTERO (acts Nos. 1114 and 1361).

Total appropriations to date	₱19,636.00
Expended previous to June 30, 1905	16,187.25
Expended during fiscal year ended June 30, 1906	3,448.13
Unexpended balance act No. 1114, returned to treasurer, Philippine Islands, December 31, 1904	.61
Unexpended balance act No. 1361, returned to treasurer, Philippine Islands, November 29, 1905	.01
Total	19,636.00

REPAIRS TO ROADS AND BRIDGES, PHILIPPINE ISLANDS (act No. 1).

Amount on hand July 1, 1905.....	₱14,005.90
Expended during fiscal year ended June 30, 1906.....	5,792.18
Unexpended balance returned to treasurer, Philippine Islands, November 29, 1905.....	8,213.72
Total	14,005.90

The expenditures shown above during fiscal year ended June 30, 1906, is for repairs to road, Santa Ana to Fort William McKinley, Rizal Province, on authority granted by the governor-general, Philippine Islands.

MAPS FOR INSULAR OFFICIALS (act No. 807).

Total appropriated.....	₱400.00
Disbursements previous to June 30, 1905.....	315.53
Expended during fiscal year June 30, 1906.....	84.46
Unexpended balance returned to treasurer, Philippine Islands, by insular disbursing officer.....	.01
Total	400.00

Expenditures on Manila Harbor work by fiscal years, 1901 to 1906, inclusive.

Year.	Atlantic, Gulf, and Pacific Co.	Salaries and wages.	Supplies and material.	Services not personal.	Settlements made by auditor for printing, cablegrams, etc.	Total.
1901.....		₱10,036.22	₱2,941.84	₱3,340.38		₱16,318.44
1902.....	₱68,743.66	35,099.32	208,011.90	7,697.20		319,552.08
1903.....	1,172,037.22	41,466.60	2,070.18	5,523.98		1,221,097.98
1904.....	2,275,876.56	81,613.24	8,142.69	2,223.80		2,367,856.29
1905.....	2,103,394.60	60,906.13	2,489.66	1,404.98		2,168,195.37
1906.....	1,447,559.66	54,463.39	5,621.32	3,247.89	₱698.61	1,511,590.87
Total.....	7,067,611.70	283,584.90	229,277.59	23,438.23	698.61	7,604,611.03

Expenditures on Pasig River work by fiscal years, 1901 to 1906, inclusive.

Year.	Salaries and wages.	Supplies and material.	Services not personal.	Settlement made by auditor, for printing, cable- grams, etc.	Total.
1901.....	₱30,642.34	₱28,607.34	₱3,158.54		₱62,408.22
1902.....	150,996.48	256,247.16	2,128.64		409,372.28
1903.....	161,142.44	177,362.80	44,881.04		383,386.28
1904.....	157,241.41	102,395.04	2,994.90		262,631.35
1905.....	110,113.91	51,343.57	1,336.70		162,794.18
1906.....	49,994.85	22,481.21	8,178.88	₱163.80	80,818.74
Total.....	660,131.43	638,437.12	62,678.70	163.80	1,361,411.05
Grand total, harbor and river.....					8,966,022.08

Improvement of the port of Iloilo.

Year.	J. G. White & Co.	Salaries and wages.	Supplies and material.	Services not personal.	Total.
1905 (June).....	P15,064.92	P1,069.97	P33.51	P55.65	P16,224.05
1906.....	191,512.38	14,364.26	374.58	1,361.10	207,612.32
Total.....	206,577.30	15,434.23	408.09	1,416.75	223,836.37
Expenditures prior to work being turned over to this bureau.....					75,922.08
Total to June 30, 1906.....					299,758.45

Surveys and investigations, ports of the Philippine Islands (act No. 1449).

Year.	Salaries and wages.	Supplies and material.	Services not personal.	Total.
1906.....	P10,225.65	P1,848.02	P5,750.93	P17,824.60
Total expended to June 30, 1906.....				P17,824.60

Improvement of the port of Cebu.

Year.	J. G. White & Co.	Als'che, Fabricken Portland Cement Co.	Salaries and wages.	Supplies and material.	Services not personal.	Total.
1905 (June).....			P2,093.91	P196.11	P54.40	P2,344.42
1906.....	P87,843.96	P135,786.86	16,983.03	1,287.69	1,051.68	242,953.22
Total.....	87,843.96	135,786.86	19,076.94	1,483.80	1,106.08	245,297.64
Expenditures prior to work being turned over to this bureau.....						6,629.79
Total.....						251,927.43

Respectfully submitted.

W. L. FISK,
Lieutenant-Colonel, Corps of Engineers, U. S. Army,
Director of Port Works.

To the SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

NOTE.—The following blueprints accompanying this report and are on file in the War Department:

Plate No. 1, port works for Manila showing work done during fiscal year 1906.

Plate No. 2, sketch showing progress of dredging on bar and lower Pasig River.

Plate No. 3, improvement of the port of Iloilo, progress plan.

EXHIBIT G.

REPORT OF THE DIRECTOR OF COAST SURVEYS.

COAST AND GEODETIC SURVEY,
Manila, P. I., July 10, 1906.

SIR: I have the honor to submit the following report of the work of the Coast and Geodetic Survey in the the Philippine Islands during the fiscal year ending June 30, 1906:

FIELD WORK.

The following is a brief summary of the field work done during the fiscal year: *Guimaras Strait and coast of Negros*, hydrography and topography, steamer *Research*, July, 1905, W. C. Dibrell, commanding. The work in progress at the beginning of the fiscal year was extended to include the vicinity of Bacolod, the capital of Occidental Negros. The *Research* returned to Manila July 29, after an absence of nearly fourteen months.

Manila Bay to Lingayen Gulf, triangulation through the central valley of Luzon, shore party, July and August, 1905, W. B. Fairfield, chief of party. This work, in progress during the preceding fiscal year, was completed, furnishing a connection between the surveys on the west coast of Luzon and the positions of many intermediate points.

Northeast coast of Samar, vicinity of Laoang, general survey, hydrography, triangulation, and topography, shore party with chartered launch *Comillas*, July to October, 1905, O. W. Ferguson, chief of party. This work was commenced in the preceding fiscal year, and was completed in October. It furnishes the data for new chart of Laoang Bay, Port Palapag, and vicinity.

East coast of Samar, general survey, hydrography, topography, and triangulation, steamer *Pathfinder*, July to September, 1905, Ferdinand Westdahl, commanding. This work, commenced in the preceding year, was continued until September 25, when a severe typhoon damaged the vessel so that it had to be towed to Manila. The *Pathfinder* was very close to the track of the storm's center; the barometer on the vessel showed a minimum of 27.16 inches, the lowest ever observed in the Philippines. The work had been completed between the north entrance to Port Libas and about 5 miles north of Apiton Island.

East coast of Luzon, Maqueda Channel, etc., general survey, hydrography, topography, and triangulation, steamer *Fathomer*, July, 1905, C. C. Yates, commanding, August to November, 1905, W. C. Dibrell, commanding. This work, commenced in the preceding fiscal year, was continued as long as the monsoon season permitted. Maqueda Channel, the area between Lahuy and Catanduanes islands, the dangers northwest of Catanduanes Island and a portion of Tagun Bay, were completed, some additional hydrography was done south of Catanduanes Island, and a reconnaissance was made of a part of the east coast of Catanduanes.

Verde Island Passage and Tayabas Bay, general survey, hydrography, topography, and triangulation, steamer *Research*, October, 1905, to April, 1906, D. R. Jewell, commanding. This work comprised a survey of the anchorage and vicinity of Calapan, Mindoro, of Pagbilao Bay, Port Laguimanoc, Lucena Anchorage, and the coast from Lucena to Batangas Bay, including the eastern part of Verde Island passage.

West coast of Luzon, topography north of Capones Island and triangulation to connect with Subic and Manila Bay triangulation, shore party, November, 1905, to January, 1906, F. B. Latham, chief of party. This work was for the purpose of completing the topography of the Zambales coast as far south as Capones Islands, and joining the triangulation along the Zambales coast with that north from Manila Bay and with the longitude station at Subic.

West coast of Leyte, from Villaba to Hilongos, general survey, hydrography, topography, and triangulation, steamer *Marinduque*, December, 1905, to April, 1906, H. C. Denson, commanding. Besides general survey of the coast, detailed surveys were made of Palompon Harbor, Dupon Bay, Siapon Bay, and the anchorages at Baybay, Inopacan, and Hindang. The offshore hydrography was not completed.

West coast of Luzon, ports Masinloc and Matalvi, Santa Cruz Harbor, and Dasol Bay, hydrography, shore party with chartered launch, December, 1905, to May, 1906, C. G. Quillian, chief of party. Detailed hydrographic survey was made of ports Masinloc and Matalvi, additional work was done at Santa Cruz, and a survey of Dasol Bay was completed.

Southwest coast of Mindanao, vicinity of Malabang, general survey, hydrography, topography, and triangulation, steamer *Fathomer*, December, 1905, to April, 1906, D. B. Wainwright, commanding. This survey extended from Lapitan Point to Tapan Point, and included the development of the reef on which the *Buford* struck, as well as other dangers reported south of Malabang. A survey was made of the north entrance of the Mindanao River as far as Cotabato. A line of deep soundings was run between Flecha Point and Malabang, along the route of the cable. A reconnaissance was made of the coast between Tapan Point and Quidapil Point.

West coast of Luzon, coast of Zambales Province, hydrography, steamer *Romblon*, December, 1905, to April, 1906, L. H. Westdahl, commanding. Some additional hydrography was done to complete Palauig Reefs, and the hydrography was completed as far north as the entrance to Santa Cruz, excepting ports Masinloc and Matalvi, which were done by another party. The hydrography was also completed between the Capones Islands and Port Silanguin, and the topography and triangulation extended along this stretch. Soundings were also made southwest of Los Frailes, proving the nonexistence of reef reported as extending from them.

Southwest coast of Luzon, triangulation from Manila Bay entrance through Verde Island Passage, January to June, 1906, launch *Erica*, O. W. Ferguson, chief of party. This work was carried on with a small chartered launch, and is an extension of the main triangulation, which it is proposed to carry as far south as Mindanao through the channels between the islands. Many points, islands, mountains, and light-houses are included in the triangulation, the determination of which will greatly aid in the charting of the coast as well as in other surveys. A station was established on the summit of Mount Calavite, on the northwest extremity of Mindoro. The ascent of this mountain was difficult, and its elevation is higher than has been shown.

South and west coasts of Panay Island, from Tigbauan westward to San Jose de Buenavista, triangulation and topography, shore party, January to February, 1906, C. M. Sparrow, chief of party, February to May, 1906, E. B. Latham, chief of party. This work joins on to the former surveys near Iloilo and extends to the southwest extremity of Panay and then north along the west coast.

East coast of Luzon, Atimonan to Polillo Island, general survey, hydrography, topography, and triangulation, steamer *Marinduque*, April to June, 1906, H. C. Denson, commanding. At the end of the fiscal year a survey of Port Lampon had been completed, and a survey of harbor on east coast of Polillo Island was in progress.

Guimaras Strait and north coast of Negros, general survey, hydrography, topography, and triangulation, steamer *Research*, April to June, 1906, J. B. Boutelle, commanding. At the end of the fiscal year surveys had been completed to Tomonton Point, and the work was in progress.

East coast of Luzon, Daet to Sogod Bay, general survey, hydrography, topography, and triangulation, steamer *Romblon*, May to June, 1906, L. H. Westdahl, commanding. This work was in progress at the end of the year.

East coast of Luzon, Lahuy Island to Daet, general survey, hydrography, topography, and triangulation, steamer *Fathomer*, May to June, 1906, D. B. Wainwright, commanding. This work was in progress at the end of the year.

East coast of Samar, Gumay Bay to Bacan Island, and coast south of Port Libas, general survey, hydrography, topography, and triangulation, steamer *Pathfinder*, May to June, 1906, F. Westdahl, commanding. This work was in progress at the end of the fiscal year.

North coast of Samar, Laoang Bay to Cabaun Island, general survey, hydrography, topography, and triangulation, shore party with chartered launch, June, 1906, C. G. Quillian, chief of party. This work is to fill in the unsurveyed por-

tion of the north coast of Samar, and was commenced at the close of the fiscal year.

North coast of Mindanao, vicinity of Oroquieta, and west shore of Iligan Bay, general survey, hydrography, topography, and triangulation; shore party, June, 1906; E. B. Latham, chief of party. A chartered launch will be used on this work later.

West coast of Luzon, entrance to Manila Bay, observation of currents with chartered launch June, 1906, H. L. Ford, chief of party. A few days current observations were made in the two channels at the entrance to Manila Bay.

Tidal and magnetic observations.—In addition to the field work above outlined, observations of tides, currents, and of the magnetic declination have been made in connection with the other work, and automatic self-registering tide gauges have been maintained throughout the year at Manila and Iloilo.

Survey steamers.—The steamer *Pathfinder* has been at work during the year except the time necessary for repairs, necessitated by the damage received in the September typhoon. The vessel was driven ashore on September 25, and towed to Manila, arriving there October 8, 1905. The stern frame had to be removed and sent to Hongkong for rewelding, and a number of plates had to be taken off and straightened or renewed. Owing to unexpected delays in the repairs, the *Pathfinder* was not able to leave Manila for another season's work until February 17.

The steamer *Research* was at Manila from July 29 to September 9, undergoing a thorough overhauling, including calking the hull and a new sheathing of copper. This steamer was again at Manila from April 5 to 28, for docking, minor repairs, and outfitting for another season. During the balance of the year the *Research* was continuously on the working ground.

The steamer *Fathomer* was at Manila from November 24 to December 30, 1905, for docking, minor repairs, outfitting for another season, and turning in survey results, and again from April 6 to May 4, 1906, for the same purpose. During the balance of the year the *Fathomer* was continuously on the working ground.

The steamer *Marinduque* was transferred on November 1, 1905, to the Coast and Geodetic Survey for use in survey work in the Philippines, in pursuance of a resolution of the Philippine Commission of June 23, 1905. The vessel sailed from Manila on December 10, 1905, after being completely outfitted for survey work. Some alterations were made to adapt the steamer for change of service, and necessary repairs were effected. The *Marinduque* was again at Manila from April 10 to 23, 1906, docking, turning in survey results, and outfitting for another season. During the balance of the year the steamer has been on the working ground.

The steamer *Romblon* was transferred at the same time and under the same arrangement as the *Marinduque*, and after outfitting, alterations, and repairs, sailed from Manila December 14, 1905. The *Romblon* was at Manila from April 13 to May 3, 1906, during which time the vessel was docked, repairs and some additional alterations effected, survey results turned in, and the steamer outfitted for another season. During the balance of the season, with the exception of a few days' repairs effected when coming to port for coal, the steamer has been on the working ground.

The personnel for field work has been considerably increased during the fiscal year, owing to taking over of the two additional vessels for survey work; 13 officers for the vessels arrived from the United States in November, 1905. The field force at the end of the year includes 20 of the field corps of the survey, 13 additional ships' officers, 3 extra observers, 16 foremen and recorders, 206 in crews of vessels, 25 tide observers, cooks, leadsmen, and hands on shore parties, a total of about 283. Since December, 1905, 8 vessels or parties, consisting of the 5 steamers, *Pathfinder*, *Fathomer*, *Marinduque*, *Romblon*, and *Research*, have been engaged in the survey work, 2 chartered launches, *Erica* and *Frisco*, and a shore party using land transportation. All but one of these parties is so organized as to be capable of working from 1 to 4 subparties. The experiment tried last year of placing 2 Filipino recorders or draftsmen on the *Fathomer* proved quite successful in adding to the strength of the working force in the field. A similar arrangement has now been made on the other three of the larger vessels and on the shore parties, there being no longer serious difficulty in obtaining natives with sufficient knowledge of English.

Progress of field work.—The following is a summary of work accomplished each year since the commencement of the work in the Philippine Islands up to close of fiscal year 1905:

	Fiscal years—					Total, 1901 to 1905, inclusive.
	1901.	1902.	1903.	1904.	1905.	
Hydrography:						
Area developed.....sq. stat. miles..	29	393	1,861	1,552	2,498	6,333
General coast line.....statute miles..	9	142	302	265	307	1,025
Number of soundings.....	17,346	46,938	125,959	118,691	195,604	504,538
Topography:						
General coast line.....statute miles..	38	262	409	439	257	1,405
Detailed coast line.....do.....	89	487	632	713	494	2,415
Triangulation:						
Progress in statute miles.....	15	155	354	340	187	1,051
Points determined.....	100	322	562	421	409	1,814
Points occupied.....	56	192	299	193	126	866
Tide stations.....	9	19	20	10	17	75
Telegraphic longitude stations.....	12	10	15	2	0	39
Magnetic stations.....	13	14	21	5	3	56

Taking the general coast line completed as a basis of the general progress of the work, and assuming that the hydrography and the topography (based on triangulation) each represents half of a complete survey, the mean of 1,025 miles of coast line hydrography and 1,405 miles of coast line topography gives an equivalent of 1,215 statute miles of general coast line completed to the end of the fiscal year 1905, or 10.5 per cent of the total general coast line of the Philippines.

Final data is not yet available for the results of the work of the fiscal year 1906, but it is estimated that the equivalent of 430 statute miles of general coast line will have been completed, making a total to the end of the fiscal year of 1,645 miles, or 14.3 per cent of the coast line of the islands.

It is estimated that about 1,254 miles of general coast line in addition to the above are charted with sufficient completeness to meet the present needs of commerce, as a result mainly of Spanish and British surveys. This added to the above gives a total of 2,899 statute miles, or about 25 per cent, charted sufficiently at the present time.

Cost of work.—The following is an approximate summary of the expenditures for this work in the Philippine Islands for each fiscal year to the close of the fiscal year 1905, stated in United States currency:

	1901.	1902.	1903.	1904.	1905.
Manila office	\$2,756	\$8,716	\$13,844	\$18,097	\$27,313
Operation of vessels		60,397	81,922	87,595	104,676
Repairs of vessels		2,908	14,163	11,991	33,144
Other field expenses	8,882	12,029	33,005	28,207	25,292
Total running expenses.....	11,638	84,050	142,934	145,890	190,425
Purchase and construction of vessels	18,069	13,247	.....	15,425	65,235

Of the total of the above expenditures, 63 per cent has been paid by the United States, and 37 per cent by the government of the Philippine Islands. The above figures include salaries but do not include the value of vessel and of instrumental equipment furnished by the United States, or the value of office accommodations furnished by the Philippine government.

Complete figures for the fiscal year 1906 are not available at the time of preparing this report, but the total expenditure for this fiscal year is about \$262,500, of which about 66 per cent has been paid by the United States, and about 34 per cent by the Philippine government.

The following is a summary of the average cost of various items of field work in the Philippine Islands, as derived from statistics to the end of the fiscal year 1905, United States currency:

Hydrography:

Area developed, average cost per square statute mile-----	\$38. 00
General coast line, average cost per statute mile-----	234. 00
Soundings, average cost per sounding-----	. 47

Topography:

General coast line, average cost per linear statute mile-----	67. 00
Detailed coast line, average cost per linear statute mile-----	39. 00

Triangulation:

Progress along axis, average cost per linear statute mile-----	91. 00
Points determined, average cost per point-----	52. 00
Stations occupied, average cost per station-----	110. 00

The following are the geographical statistics, as to the Philippine Islands, from recent measurements made in the office of the coast and geodetic survey, Manila:

General coast line, measured on charts of scale $\frac{1}{400000}$, using three-mile steps of dividers-----	statute miles--	11, 511
Total area (land and water) within treaty boundaries (following map Census Report, Vol. 1, 1903)-----	square statute miles--	700, 986
Total land area (as estimated in 1903)-----	do--	115, 026
Total water area within boundaries-----	do--	585, 960
Total water area requiring hydrographic examinations for charting purposes:		
Area of general depth less than 100 fathoms, square statute miles, approximately-----		140, 000
Area of general depth more than 100 fathoms, square statute miles, approximately-----		215, 000
		<hr/> 355, 000

OFFICE WORK.

Under the existing plan the preliminary office work is completed at Manila, for the reason that much of it can be done to better advantage in the regions concerned than it could be so far away as Washington. The work is done in the following divisions, computing, nautical, chart construction, and correspondence and property. The director, in addition to general supervision of these divisions, prepares specifications for field work and for charts, and examines chart drawings and nautical information prepared for publication.

Computing division.—E. R. Frisby, chief computer, was in charge from July 1 to August 18, when he went to the United States for duty, and was again in charge on his return from May 12 to June 30. During his absence S. H. Schapiro was in charge. There have also been employed on computing work two junior computers and two temporary recorders. The work of this division comprises the receipt and register of all survey records (not drawings), and the completion of all computations necessary to put the field records in shape for chart construction or other purpose. Where computations are made in the field they are verified. The principal classes of computations are the reduction of tidal observations and planes of reference, reduction of astronomical observations for latitude, longitude, and azimuth, reduction of all soundings to mean lower low water, computation of distances, positions, and elevations from triangulation, and computation of magnetic declination.

Data must constantly be prepared for the use of field parties in extending surveys, and for the office in plotting hydrographic sheets and preparing charts.

Nautical division.—This was in charge of H. L. Ford, nautical expert, from July 1 to September 30, 1905, when J. C. Dow, nautical expert, returned from duty in the United States and resumed charge. Mr. Ford was again in charge from June 14 to 30. Two chart correctors have been employed in this division the greater part of the year.

The following publications have been prepared and verified:

Notices to Mariners, Nos. 8 to 15 of 1905.

Notices to Mariners, Nos. 1 to 6 of 1906.

Sailing Directions, Section I, north and west coast of Luzon and adjacent islands, 1906 (third edition).

Sailing Directions, Section II, southwest and south coasts of Luzon and adjacent islands from Manila to San Bernardino Strait, 1906 (third edition).

Sailing Directions, Sections VI and VII, Mindoro Strait, Palawan, and Sulu Sea and archipelago, 1906 (second edition). The two sections will be published together.

Catalogue of charts, sailing directions, and tide tables of the Philippine Islands, 1906.

The above have been printed and issued, with the exception of Sections II and VI and VII, which are in press.

This division has now also charge of the correction and issue of charts and nautical publications, and of furnishing information in response to inquiries regarding charts and sailing directions. Files of charts and other publications concerning the Philippine Islands and adjacent waters are kept for reference by those interested.

The Manila office has this year undertaken to examine files of Coast and Geodetic Survey charts sent in from ships, and make necessary corrections, or mark charts which are canceled. During the year 23 sets of Philippine charts have been so examined. With the facilities of the office this can readily be done. In almost every set of charts sent in for examination a number were found as still in use which were obsolete, being canceled by later charts or editions.

This division has assisted in the inspection of survey steamers, the preparation of specifications for repairs, the examination of requisitions for supplies for vessels, and the filing of papers and drawings regarding the vessels.

A table of distances between Philippine ports has been prepared, and measurements have been made of the shore line of each island, and of the water area of the islands.

For the purpose of collecting information and verifying sailing directions, voyages were made by Mr. Ford to Bolinao and return in July, to Cape Engano and return in July and August, and around Palawan Island in December, the last on invitation of the secretary of the interior of the Philippine government. Mr. Ford also accompanied the tug *Robert K.*, sent to the relief of the *Pathfinder* in October.

A systematic collection and arrangement of records and information regarding currents has been undertaken.

Distribution of publications.—The following is a summary of the distribution of publications from the Manila office during the past fiscal year, as well as for previous years since the commencement of the work in the islands. The numbers stated are exclusive of stocks of publications sent to Washington for distribution there.

	Fiscal years—					
	1901.	1902.	1903.	1904.	1905.	1906.
Charts sold.....	.....	226	867	536	847	1,774
Charts official use.....	164	2,032	3,544	2,216	5,105	5,841
Total.....	164	2,258	4,411	2,752	5,952	7,615
Tide tables.....	.....	29	65	89	79	133
Sailing Directions, Philippine Islands.....	.....	.....	1,800	2,519	2,200	1,200
Notices to Mariners, Philippine Islands.....	900	5,500	6,000	8,093	9,000	9,500
Chart Catalogues, Philippine Islands.....	.....	.....	600	50	400	400

Chart construction division.—This was in charge of J. P. Keleher, chief draftsman, to September 19, and since then has been in charge of John Bach, cartographer, who has been assisted by Arthur Dovale, cartographer, since August 25; by O. E. Carr, draftsman, since April 23, and by 12 junior draftsmen and 3 apprentice draftsmen. The work of this division includes the preparation of drawings for new charts and new editions of charts, the completion of unfinished field sheets, as the inking of topographic sheets and the plotting of hydrographic sheets, the preparation of projections for field parties, and of various miscellaneous drawings required, the examination and verification of hydrographic sheets, the examination and registry of all survey sheets, and the verification of chart drawings.

The following chart drawings or extensive corrections have been completed in Manila during the fiscal year and forwarded to the United States for print-

ing, comprising 12 new charts, 5 complete new drawings for new editions, 7 extensive additions for new editions, making a total of 24 charts or new editions:

- No. 4266. Ports Masinloc and Matalvi.
- No. 4255. Manila Bay (additions for new edition).
- No. 4254. Harbors of Burias Island (additions for new edition).
- No. 4243. Manila and Cavite anchorages (new edition).
- No. 4233. Pasig River, upper part.
- No. 4459. Capiz to Calibo.
- No. 4418. Southeast Masbate.
- No. 4208. Solvec Cove to San Fernando.
- No. 4246. San Fernando Harbor (new edition).
- No. 4613. Iligan Bay (additions for new edition).
- No. 4711. Northern Luzon (new edition).
- No. 4342. Halsey Harbor (new edition).
- No. 4714. Mindoro, etc. (additions for new edition).
- No. 4259. Rapurapu Strait (new edition).
- No. 4309. Balabac Strait.
- No. 4512. Samales Islands.
- No. 4544. Siasi and Lapac Islands.
- No. 4220. San Bernardino Strait.
- No. 4647. Agusan River Entrance.
- No. 4715. Southeastern Luzon (new edition).
- No. 4713. East Coast of Luzon (new edition).
- No. 4460. Iloilo Strait.
- No. 4712. West Coast of Luzon (new edition).
- No. 4543. Isabela Channel.

Drawings have also been prepared for a base map of the Philippine Islands, and a chart index map, both of which have been published.

There have been published in Washington during the year 18 new Philippine charts, and 9 new editions or new prints of charts, making a total of 27 charts or new editions, as follows:

- No. 4644. Harbors on North Coast of Mindanao.
- No. 4710. Batanes Islands.
- No. 4348. Cagayan Sulu.
- No. 4724. Southeast Mindanao.
- No. 4618. Dumanquilas Bay and part of Iligan Bay.
- No. 4346. Harbors of Palawan Island.
- No. 4723. Western Mindanao.
- No. 4209. Lingayen Gulf.
- No. 4316. Northwest Coast of Palawan.
- No. 4541. Jolo anchorages (new edition).
- No. 4347. Harbors near Balabac Strait.
- No. 4514. Tawitawi Group.
- No. 4232. Manila Harbor.
- No. 4207. Laoag to Vigan.
- No. 4266. Ports Masinloc and Matalvi.
- No. 4255. Manila Bay (new edition).
- No. 4243. Manila and Cavite Anchorages (new edition).
- No. 4459. Capiz to Calibo.
- No. 4418. Southeast Masbate.
- No. 4208. Solvec Cove to San Fernando.
- No. 4246. San Fernando Harbor (new edition).
- No. 4233. Pasig River, upper part.
- No. 4254. Harbors of Burias Island (new edition).
- No. 4613. Iligan Bay (new edition).
- No. 4711. Northern Luzon (new edition).
- No. 4342. Halsey Harbor (new edition).
- No. 4714. Mindoro, etc. (new edition).

At the close of the fiscal year there were in preparation at Manila drawings for 16 new charts, or new editions of charts, of which 5 were near completion.

Correspondence and property division.—W. H. MacDonald has continued to act as chief clerk in charge of routine business of the office, including property returns, the first checking of vouchers, time records, requisitions, forwarding instruments and supplies to field parties, stationery, etc. William Auerbach, clerk and stenographer, resigned in February, and was succeeded by W. A.

Kelley. Three recorders, temporarily employed, and one messenger assist in the general office work. With the material increase made in the field force during the year, the clerical work, especially the property accounting, became too heavy for the force available, and an additional clerk was authorized.

The total office force consists of the following: Director, 1; computers, 2; nautical experts, 2; cartographers, 2; draftsmen, 1; clerks, 3; junior computers, 2; junior draftsmen, 13; apprentice draftsmen, 3; recorders (computing), 2; recorders (clerical), 3; recorder (chart correcting), 1; messenger, 1; total, 36.

J. B. Boutelle, assistant, Coast and Geodetic Survey, was on duty in the office from September to April, and was in charge from December 25 to 30. Other members of the field force have been temporarily on duty in the office for short periods, engaged on either drafting or computing.

Joint arrangement.—During the year the work has been prosecuted under the same general plan of division of expense as previously, and in accordance with the additional arrangement made as to the operation of the two steamers transferred by the resolution of the Philippine Commission of June 23, 1905, and as authorized by the United States authorities. The United States has paid the salaries and subsistence of its technical corps detailed for this duty, including several experts in the office; has furnished instrumental equipment; has paid the expenses of one large surveying steamer, of supplies for two other surveying steamers, of chart publication, of traveling expenses to and from the United States, and hire of launches. The Philippine government has paid the operating expenses of two surveying steamers and the crew and repairs of two other surveying steamers (not including officers), the contingent expenses of several shore parties, of the office force locally employed, and of office supplies obtained in Manila, and has furnished office accommodations and printing. Money and property accounts are rendered to each government for the resources furnished, respectively, and complete duplicate reports of all work accomplished are rendered to the secretary of the department of commerce and police of the Philippine government and to the Superintendent of the Coast and Geodetic Survey at Washington.

Additional office space in the Intendencia Building has been assigned to the Survey during the year, greatly relieving the crowded condition of the drafting room, and providing additional storage space.

In order to systematize the field work "General instructions for coast surveys in the Philippine Islands" have been prepared and printed in a convenient form for the use of field parties.

Convenient inventory and requisition lists have been prepared and printed for use of vessels and field parties.

Valuable information has been received from many sources, including the commander in chief, United States Asiatic Fleet, bureau of port works, bureau of navigation, chief engineer Philippine division, military information division, bureau of public works, city engineer of Manila, officers of merchant vessels, and others. In response to request and inquiries, special information other than or in advance of publication has been supplied to many officers and persons.

A sketch is attached showing the work accomplished by the Coast and Geodetic Survey in the Philippine Islands to June 30, 1906.^a

Respectfully submitted.

G. R. PUTNAM,
*Assistant, Coast and Geodetic Survey,
Director of Coast Surveys, Philippine Islands.*

The SECRETARY OF COMMERCE AND POLICE,
Manila, P. I.

^a This map is on file in the War Department.

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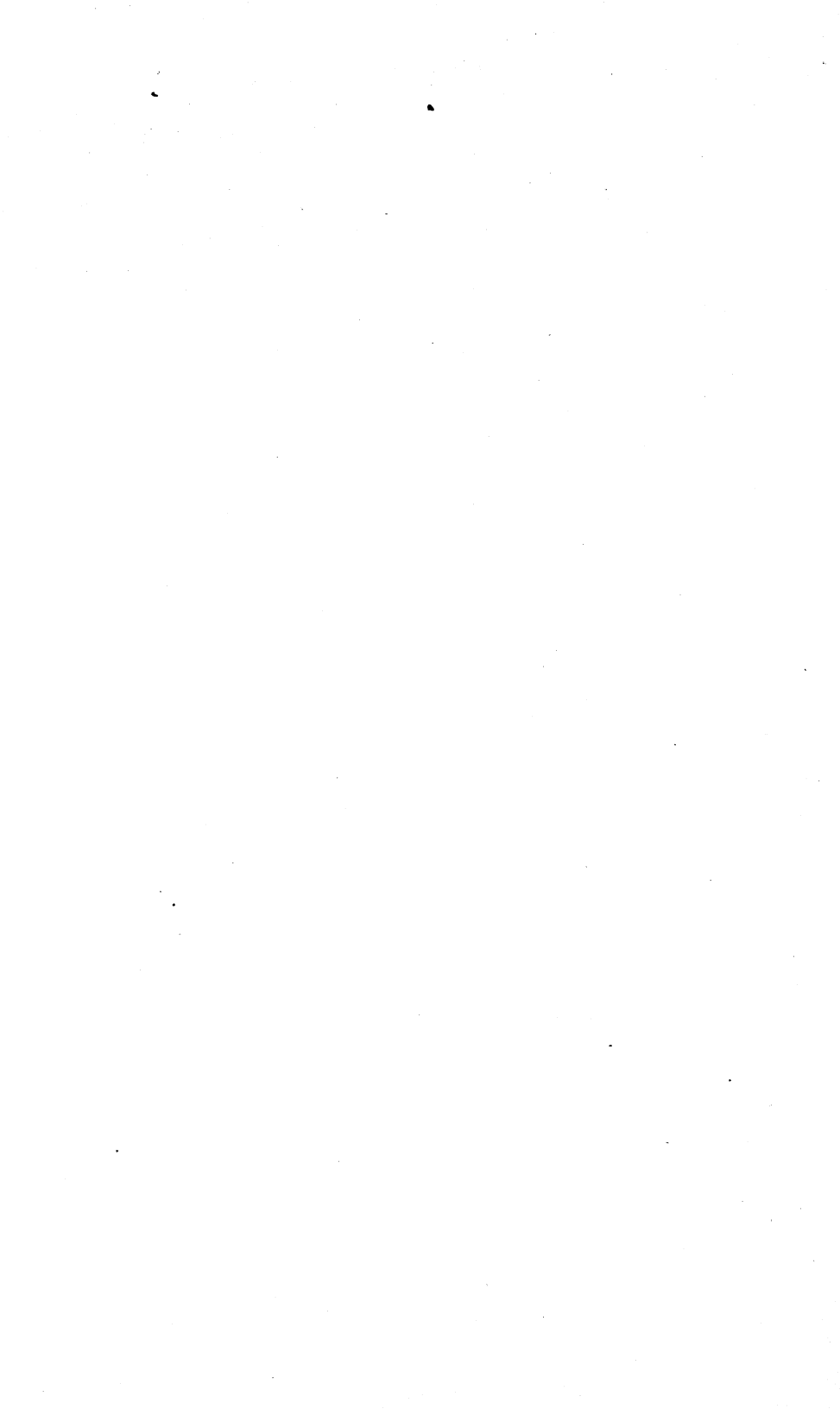
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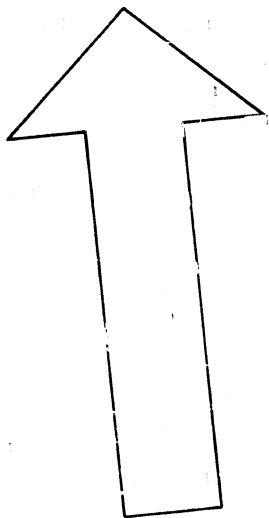
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